

The Iron Age

A Chilton Publication

THE NATIONAL METALWORKING WEEKLY • JANUARY 27, 1955

What's behind
the U. S.
uranium boom?
See page 34



\$100,000-A-Year Production Idea!

How Ray-O-Vac replaced brass for flashlight cases with Thomas electro-coated steel strip at a production saving of 17 to 29 per cent and came up with a better quality product. See inside story with complete technical details on Pages 18-19.

"Everything New...
But The Name"

Thomas Strip

Thomas Strip Division
Pittsburgh Steel Company • Warren, Ohio

COLD ROLLED
STRIP STEEL

P

How long will this valve last?



Hoskins Chromel-Alumel thermocouple alloys accurately register exhaust temperatures of jet aircraft engines.



Heating elements made of Hoskins Chromel give long life service in industrial electric furnaces, home appliances.



Hot stuff for hot jobs! Hoskins Alloy 502 is widely used by industry for many heat resistant mechanical applications.

You're looking in on a life-saving operation . . . one that's being performed on an engine valve. Not an ordinary valve for an ordinary engine. But a valve destined for long, hard service in an aircraft, tank, or heavy-duty truck engine. A valve that must be made to stand up under extremely severe operating conditions . . . high temperatures, for long periods of time, plus the destructive corrosive action of hot exhaust gases.

And what's responsible for long valve life under such gruelling conditions? Nothing less than Hoskins Alloy 717 . . . a closely controlled nickel-chromium composition developed especially for just such tough and vital service. It's highly resistant to heat . . . immune to the corrosive atmospheres created by combustion of high octane fuels. What's more, it's readily applied

by fusion to form a non-porous protective facing over the basic valve forging.

But 717 is only one of several specialized nickel-chromium alloys developed and produced by Hoskins. Among the others: Alloy 502 . . . known throughout industry for its dependability on a wide range of heat resistant mechanical applications. The Chromel-Alumel thermocouple alloys . . . unconditionally guaranteed to register true temperature-E.M.F. values within specified close limits. Spark plug electrode alloys which have become universally accepted standards of quality and durability. And, of course, there's Hoskins CHROMEL . . . the original nickel-chromium resistance alloy used as heating elements and cold resistors in countless different products.

HOSKINS
MANUFACTURING COMPANY

4445 LAWTON AVENUE, DETROIT 8, MICHIGAN



He's giving the roll a facial



Let's look in for a moment on Hugh, roll grinder at our Sparrows Point sheet mill. Here he is, in characteristic position: eye glued to the roll as it turns against the abrasive wheel.

Hugh has nothing to do with actual production, but his job is vital to the ultimate quality of the sheets. The surface of a finished sheet can be no better than the surface that rolls it. For if any little imperfection, however slight, were present on the surface of the roll, it would automatically be impressed on the sheet streaming through the mill. Result: an off-product.

Small wonder Hugh is so wrapped up in his work. For he, like the men he works with, is shooting all the time for 100 per cent quality production. Only quality, as he well knows, keeps customers happy, orders on the books, men on the job. It's up to Hugh to grind away each little blemish on the roll. It's up to him to check the hardness and the crown. Above all, he

must carefully gage tolerances to be sure the roll will be precisely right for the job it has to do.

Hugh's conscientious attitude is enthusiastically shared by the other men in our Sparrows Point and Lackawanna sheet mills. Each man knows that he is part of a highly expert team. That team is out to win. The goal: to produce the best hot-rolled and cold-rolled sheets made anywhere.

How are they doing? Well, anyone can claim the best, of course, but self-praise is unbecoming. So we'll just say this: our sheet mills at Sparrows Point and Lackawanna are turning out sheets that at the very least will stack up favorably with the best the industry is making. Sheets as finely finished, as easy forming, as true to gage as any on the market. Sheets as fine as you can buy!

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM SHEETS

DIGEST OF THE WEEK

Vol. 175, No. 4, January 27, 1955

Starred items are digested at the right

EDITORIAL

Random Budget Reactions	7
-------------------------	---

SPECIAL FEATURE

*Official Iron Age District Steel Capacities	44A
--	-----

NEWS OF INDUSTRY

*Special Report: Oxygen Boosts Openhearts	31
*Economy: Ike Predicts a Good Year Ahead	33
*Uranium: The Boom is Here to Stay	34
*Management: Counseling for Workers' Wives	37
*Smog: Auto Industry Near to Practical Remedy	39
Industrial Briefs	46
Personnel: Iron Age Salutes	61
Iron Age Introduces	63

NEWS ANALYSIS

Newsfront	29
*Report to Management	45
*Automotive Assembly Line	48
*This Week in Washington	53
West Coast Report	57
Machine Tool High Spots	59

TECHNICAL ARTICLES

*Peroxygen Compounds Good for Metal Treating	71
*Crane Scale Simplifies Weighing Operation	75
*Outside Facilities Lower Heat Treating Costs	78
*Tilt-Turret Machine Cuts Setup Time	80
*Better Mold Feeding Setups Cut Casting Scrap	82
How to Obtain Constant Wall Thickness on Cups	86
Technical Briefs	96

MARKETS & PRICES

*The Iron Age Summary—Steel Outlook	107
*Steel Product Markets	108
Comparison of Prices	109
Iron and Steel Scrap Markets	110
*Nonferrous Markets	114
Steel Prices	117

REGULAR DEPARTMENTS

Dear Editor	9
Fatigue Cracks	11
Dates to Remember	13
Free Literature	88
New Equipment	99

INDEX OF ADVERTISERS

Copyright 1955, by Chilton Co. (Inc.)

The Iron Age, published every Thursday by CHILTON CO. (INC.), Chestnut & 50th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1895, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, \$6 for 1 year, \$8 for 2 years in the United States, its territories and Canada. All others \$15 for 1 year; other Western Hemisphere countries, \$15; other Foreign Countries, \$35 per year. Single copies, 9¢. Annual Review Issue, \$2.00. Cable: "Ironage," N. Y.

Address mail to 100 E. 42 St., N. Y. 17, N. Y.

NEWS DEVELOPMENTS
OXYGEN BOOSTS OPENHEARTH OUTPUT 10 PCT.—P. 31

Inland Steel Co. credits use of oxygen in one open-hearth shop with boosting firm's capacity 250,000 tons. Consumes 180 tons of oxygen daily. Finds it increases furnace output up to 10 pct. It's also useful in hearth cleanup and maintenance. But economic use in a steel plant varies with many factors.

PRESIDENT OPTIMISTIC IN ECONOMIC REPORT — P. 33

Presenting his Economic Message to Congress, President Eisenhower saw job and production levels staying high through 1955. Moderate curbs, tax relief in a few areas and encouragement of private capital were points covered by the President.

COUNSELING FOR WORKERS' WIVES — P. 37

Line Materials Co. conducts counseling sessions for employees' wives. The firm knows wives play an important part in success or failure of their husbands. Wives tell what bothers them most about their mates.

RESEARCH NEARS PRACTICAL SMOG REMEDY — P. 39

Hydrocarbons from exhausts of Los Angeles' 2.5 million cars is at root of eye-watering smog problem. Automotive industry's research teams are near to completion of several practical preventive devices

BUDGET IS BASED ON HIGH LEVEL PROSPERITY—P. 45

President's Budget Message shows one thing clearly: the Administration is counting on a high level of prosperity in fiscal '56, considerably higher than most government sources have indicated in their forecasts. In figuring its budget receipts the government expects personal income will reach a record high of \$298.5 billion.

MOTORAMA IS AUTO INDUSTRY'S BIG SHOW — P. 48

General Motors' extravaganza serves as a new model backdrop. Is also a sounding board for firm's major announcements. The dream cars are displayed as trial balloons to test public's reaction to new styles, design innovations which often turn up in next year's production models. See possible return of LaSalle cars.

DEMOCRATS ARE HOPING FOR TARIFF FIGHT — P. 53

Lengthy debate looms on Ike's request for tariff cuts because Democrats want to drag out issue to point up lack of unity of Republican Party on this proposal. Ike's requested 15 pct tariff reduction not likely to be approved. Reciprocal Trade will be extended.

IN METALWORKING

ENGINEERING & PRODUCTION

PEROXYGEN COMPOUNDS TREAT SURFACES — P. 71
Peroxygen compounds offer definite advantages in many surface treatment applications. Hydrogen peroxide increases intensity and adherence of black finishes on zinc and cadmium. Ammonium and hydrogen peroxide improve electrical characteristics of cuprous oxide surfaces. Peroxygen compounds are useful etching aids.

SCALE SIMPLIFIES WAREHOUSE WEIGHING — P. 75
A weighing crane with electro-hydraulic units cuts costs in weighing and handling tubular steel at this warehouse. Some mechanical weighing operations were eliminated, floor space made available, and labor requirements reduced. Weights are indicated on a dial.

SAVE ON SPECIAL HEAT TREATING NEEDS — P. 78
When just a few parts need special heat treatment, one way to save is to take them to a reliable outside source. The outside plant must be well equipped and thoroughly briefed on identifying, handling and packaging procedures. Planned teamwork keeps cost down.

TILT-TURRET MACHINE CUTS SETUP TIME — P. 80
A new machine mounting eight tool spindles on a tilting turret eliminated costly tool changing and part setups on a tough, compound angle machining job. Standard machine tools would have taken twice as long.

BETTER MOLD FEEDING CUTS CASTING LOSS — P. 82
Proper design of runners, feeders and gating systems means less castings lost because of sand, slag and dross pickup. Simple standard patterns mold feeding elements to correct size and shape for best results. Runners and gates should be located to insure minimum variations in metal temperature as molds are cast.

DRAWING CUPS TO CONSTANT WALL THICKNESS—P. 86
Keep equipment in good shape; align punch and die carefully; do not allow variations from early forming to progress beyond point of remedy in final process.

NEXT WEEK:

TUBE FORGING CAN CUT COSTS ON HOLLOW PARTS
Increased capacity for "tube forging" is widening its application in machine and structural parts. One important advantage is in shaping large, thick-walled tubes close to finished size requirements. Where applicable, the process can cut costs appreciably.

MARKETS & PRICES

WHAT'S BEHIND THE BIG URANIUM BOOM — P. 34
Uranium is the most spectacular—and controversial—segment of the mining industry today. Some flying prospectors have struck it rich. Others have gone broke. But the boom itself is solid—there's plenty of ore in the ground and there's a politically assured military market for years to come. But industrial power won't be a big market for a long time.

PHILADELPHIA GAINS MOST STEEL CAPACITY — P. 44A
Steelmaking capacity in the U. S. gained 1.5 million tons in 1954, now stands at 125,828,310 tons a year. Iron Age's Philadelphia district gained the most through big Sparrows Point boost. Chicago widened its first place lead over Pittsburgh, which was the only district showing a decline. Detroit scored a 14-per cent gain in electric furnaces. Detailed breakdown shows the industry's facilities district by district and plant by plant. Extra copies available.

STEEL MARKET WILL GET STILL TIGHTER — P. 107
There are some firm indications that the steel market will become still tighter during the next few months. For one thing auto producers are planning higher production rates. This will boost flat-rolled most.

SHEET GRAY MARKET SPREADS IN MIDWEST — P. 108
Additional evidence of a mild gray market in cold-rolled and galvanized sheets has cropped up in Cleveland. Tight market has spurred brokers into roundup of rejects and wasters. Warehouses are getting offers of second grade material at \$5 above mill prices. Some small consumers are reported selling out of inventories for as much as \$10 above mills.

PRESSURE FOR COPPER PRICE HIKE MOUNTS — P. 114
Strong demand coupled with short supply and higher European prices is creating pressure for a copper price increase. Chile is threatening to sell its copper in Europe where prices are considerably higher. This could be the factor that will force a price rise. Industry sources estimate it might go to 32.5¢.

RESEARCH AIMS AT CUTTING \$2 BILLION PAINT TAB
American industry pays a staggering \$2 billion each year for maintenance painting. Battle against corrosion is so costly that many firms have set up research programs to evaluate paint systems. This article reviews tests used by Jones & Laughlin.

Completely automatic, unattended unloading end of the Stevens Automatic Barrel showing control panel and rectifier site located above machine.



**Unistrut says—
"COSTS 50% LOWER—
FINISH BETTER with..."**

STEVENS AUTOMATIC BARREL MACHINE"

Every day in the Unistrut Corporation plant, Wayne, Michigan, thousands of small parts are zinc plated and shipped to Unistrut warehouses throughout the United States. All of these parts are zinc plated automatically by a Stevens Automatic Barrel Machine.

Unistrut high standards require a uniformity of plate on the parts used in their metal framing systems. But since installing the Stevens Automatic Barrel they have reported other advantages as well—"less handling, smaller inventories and quicker shipments." When you consider the 50% cost savings of actual plated parts too, it all adds up to a terrifically profitable investment.

Why don't you tell us your metal finishing problems and let us make recommendations. There's no obligation. Write to—

**BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS
NEW HAVEN • DAYTON**



Metal Finishing equipment and supplies from castings or stampings to finished product.



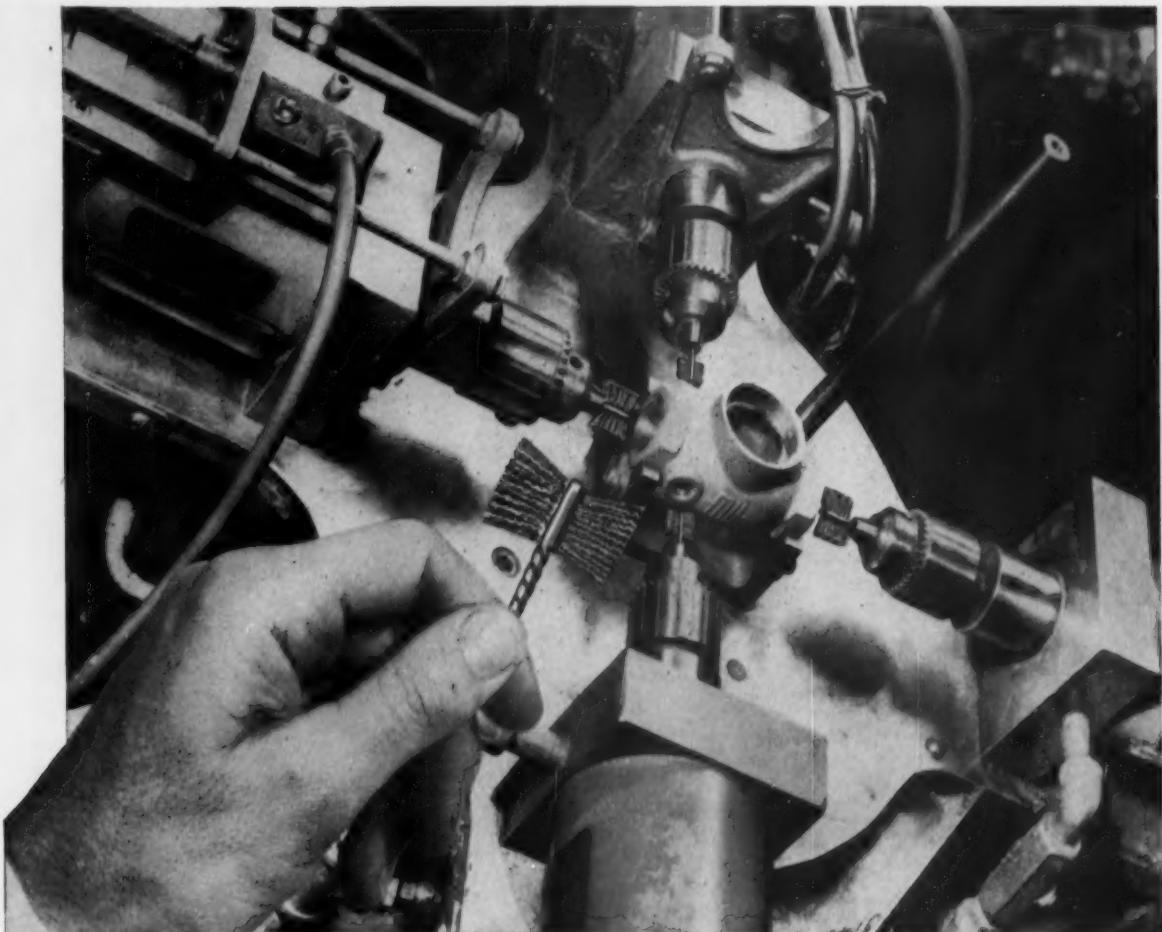
Side view of machine showing excellent drainage system.



Plating section of machine with ventilating duct work.

**FREDERIC B.
STEVENS**
INCORPORATED
YOUR METAL FINISHING SUPERMARKET

DETROIT 16, MICHIGAN



Production idea does job 66% faster

An OBA can speed your operations, too



PRODUCTION UP, COSTS DOWN. Osborn Economy® Brushes finish both sides of brass discs at a 15,000-per-day rate. Another case of power brushing doing a faster, more thorough job than a former hand method.

HERE, Osborn Power Brushing saves eight manhours per 1000 parts. Before brushing, burrs on threads were removed from each hole by hand. Now, four holes are brushed at one time . . . 66 per cent faster than before. Setup is simple, results are uniform, production steady, cost is less.

Substantial savings can be made on many types of production with Osborn Power Brushing. An **OBA**, Osborn Brushing Analysis, will show you how. Call or write *The Osborn Manufacturing Company, Dept. F-28, 5401 Hamilton Avenue, Cleveland 14, O.*

Osborn Brushes

OSBORN

BUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES



"20,000 lbs. of STRIP tomorrow morning? SURE!"

It was 6:45 one Wednesday evening when Bob Rans of the Chicago Sheet and Strip desk was interrupted at the chore of drying dinner dishes by a phone call. One of our good customers was in a jam and had traced Bob down at home. "If I don't get 20,000 pounds of slit coil stock tomorrow morning we'll have to shut down. Can Ryerson do it?"

Bob immediately called the sheet and strip night dispatcher and the second shift foreman at the plant. The order was added to the

night schedule and was ready by dawn. At 9:45 AM the required steel—cut to size and ready to use—was set down in the customer's suburban plant.

Whether you need sheets and strip, or bars, shapes and plates, you can depend on Ryerson for prompt, personal service. We have the world's largest steel stocks—the unequalled facilities—and above all the teamwork of specialists to deliver as promised. So, when you need every kind of steel, be sure...call Ryerson.

Principal products: Bars, structural, plates, sheets, tubing, alloys, stainless, reinforcing, machinery & tools, etc.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Editorial, Advertising and Circulation Offices, 100 E. 42nd St., N. Y. 17, N. Y.
Oxford 7-3400

GEORGE T. HOOK, Publisher

TOM C. CAMPBELL, Editor

EDITORIAL STAFF

Managing Editor G. F. Sullivan
News-Markets Editor W. V. Packard
Technical Editor E. C. Beaudet
Asst. Technical Editor W. G. Patton
Machinery Editor E. J. Egan, Jr.
Metal Finishing Editor J. R. Obsut
Metallurgical Editor W. D. Letiano
Asst. Markets Editor R. L. Hartschek
Asst. News Editor E. C. Kellogg
Associate Editors H. W. Van Camp, W. B. Olson, J. R. Whipple; Art Director: J. A. Degen; Regional Editors: K. W. Bennett, Chicago; R. D. Redant, Detroit; T. M. Rohan, Cleveland; J. B. Delaney, Pittsburgh; R. R. Kay, Los Angeles; G. H. Baker, R. M. Stroupe, N. R. Pegeimbel, Washington; Editorial Assistants: L. Gross, M. Perrone, C. M. Markert; Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. M. Edmonds, St. Louis; J. Miller, San Francisco; James Donnelly, Seattle; F. Sanderson, Toronto; F. H. Harley, London, England; Chilton Editorial Board: Paul Weston, Washington representative.

WASHINGTON EDITORIAL OFFICE
Washington 4....National Press Bldg.

BUSINESS STAFF

Production Manager B. H. Hayes
Director of Research Oliver Johnson
Circulation Mgr. W. M. Coffey
Promotion Manager J. A. Crites
Ass't. Research Dir. Wm. Lambeir

REGIONAL BUSINESS MANAGERS
Chicago 2 ... S. J. Smith, T. H. Barry
1 N. LaSalle St. Franklin 2-0203
Cleveland 14 ... Robert W. Watts
1016 Nat'l City Bk. Bldg. Main 1-2263
Columbus 15, Ohio ... Harry G. Mum
LeVeque-Lincoln Tower Capitol 1-3764
Detroit 2 ... Peirce Lewis
103 Pollister Ave. Trinity 1-3120
Los Angeles 28 ... R. Raymond Kay
2420 Cherokee Ave. Holyd' 7-0741
New York 17 ... C. H. Ober, C. T. Post
100 E. 42nd St. Oxford 7-3400
Philadelphia 29 ... B. L. Herman
56th & Chestnut Sts. Granite 4-5600
Pittsburgh 22 ... J. M. Spackman
1502 Park Bldg. Atlantic 1-1832
W. Hartford 7 ... Paul Bachman
42 LaSalle Rd. Adams 2-0486
England ... Harry Becker
111 Thorley Lane, Timperley, Cheshire

One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & Sixth Sts., Philadelphia 39, Pa.

OFFICERS AND DIRECTORS

JOS. S. HILDRETH, President

Vice-Presidents: P. M. Fehrendorff, G. C. Babby, Harry V. Duffy; William H. Voller, Treasurer; John Blair Moffett, Secretary; George T. Hook, Maurice E. Cox, Tom C. Campbell, Frank P. Tighe, L. V. Rowlands, Robert E. McKenna, Irving E. Hand, Everett B. Tribune, Jr., Directors.

Indexed in the Industrial Arts Index and the Engineering Index.



Editorial:

Random Budget Reactions

THOSE who read the actual Federal budget are few. Those who read the President's message and figures are not legion. Those who try to figure out what the budget means to them are many. And those who become confused number more than an army.

The budget for 1956 abounds in statistical semantics. Related to past budgets it is a vast improvement in presentation—and in objectives. It is a milestone in the law of diminishing confusion.

We will spend slightly less for national security in the 1956 fiscal year than in 1955. But we will have \$2.4 billion more in new obligations (appropriations) than we had in 1955. This could mean we will spend more (spending means paying the bill for something ordered anywhere from 1 year to 2 years ago) in the 1957 fiscal year because obligations increased in 1956.

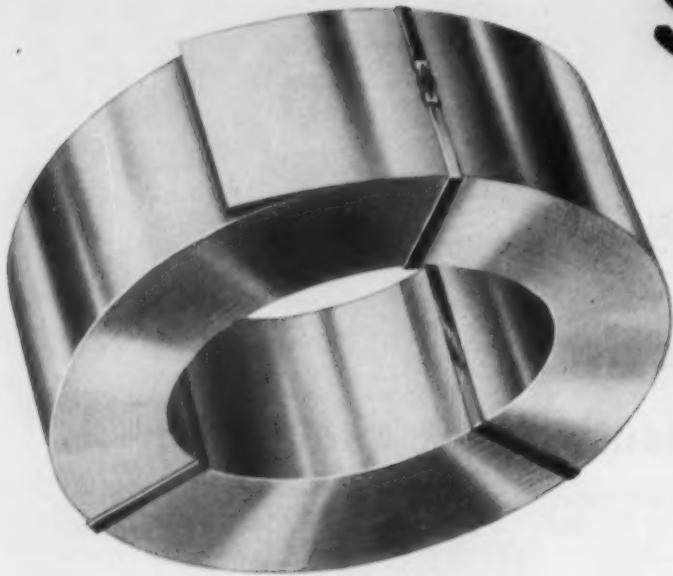
When the Defense Department made up its estimates they totaled \$35.7 billion for the fiscal year 1956. Officials, however, figured that some way or other \$1.7 billion could be saved. On that basis they deducted the \$1.7 billion from the original estimates and called it the new budget. It is strongly debatable whether or not such savings can be made. Even the President has said that future savings will be more difficult to obtain. It is also unusual to consider an estimated saving as an accomplished fact and make it a deduction.

In looking for an overall deficit of \$2.4 billion in the fiscal year of 1956 compared to the deficit of \$4.5 billion in 1955 the Administration expects substantial improvement in employment, production and income.

As unexpended security authorizations are used, more new appropriations can be expected in future years. Proof is in the 1956 budget.

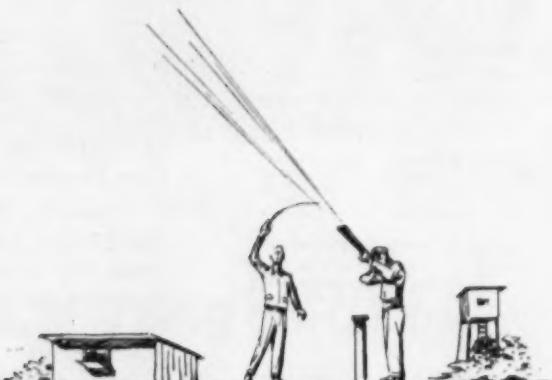
Reasonable conclusions are: Defense expenditures are going up in the next budget; defense order placing will increase because new obligations have been increased in the 1956 budget; the Federal budget can be expected to be unbalanced over the next few years unless receipts increase substantially; and finally, international affairs and the coming presidential election will have as much cause and effect on the budget as does clear logic.

Tom Campbell
EDITOR



SHOOTING
for
Greater
Sales?

Design



with **SHARON**
STAINLESS STEELS



Sharon produces all popular grades of Stainless Steel in large diameter coils for economical fabrication, and with the finest finish available in the industry.



Type 430 Stainless
and Galvanite®
Coated booklets are
available from any
Sharon office.

*Trademark registered by
Sharon Steel Corporation

District Sales Offices

Chicago • Cincinnati • Cleveland
Dayton • Detroit • Grand Rapids
Indianapolis • Los Angeles • Milwaukee
New York • Philadelphia • Rochester
San Francisco • Seattle • Montreal, Quebec
Toronto, Ontario.

SHARON STEEL CORPORATION

Sharon, Pennsylvania

dear editor:

letters from readers

Timetable For 1955

Sir:

I like your Jan. 13 editorial ("How Not To Be Caught In 1955") very much and think it should be read by some of our customers who do not read IRON AGE.

May I have permission to reprint, with credit to IRON AGE? If we can persuade just one person to forget his fears and phobias it will be well worth while. *J. Pratt, Jack Steelman, Inc., Seekonk, Mass.*

Castable Refractories

Sir:

We have read with interest the lead-off article on "Castable Refractories" which appeared on p. 47 in your Dec. 30 issue.

As manufacturers of LUMNITE, a refractory cement oftentimes used as the binder in many commercial castables, we are certain that articles of this type will stimulate interest in this field. We are, of course, always pleased to read technical articles on refractories and take every opportunity to circulate them to interested parties not only within our own organization but to the people with whom we are in daily contact. You may be certain that any articles which appear in THE IRON AGE of a similar nature will receive our complete endorsement. *Frank E. Lobaugh, Manager, Lumnite Div., Universal Atlas Cement Co., New York.*

Photo Credit

Sir:

We are in receipt of a reprint of an article which appeared in the Oct. 28 issue of THE IRON AGE concerning major expansion by Sandusky Foundry & Machine Co.

We have read this article over with a great deal of interest, and we notice on the back page of this reprint illustrations of equipment for drilling holes in the large cylinders referred to in the article. . . .

It just so happens that the Moline Tool Co. has built the equipment for this firm for drilling many thousands of holes in these cylinders as shown by the illustration at the bottom of the last page of the reprint. Our attention has been called to this illustration, and the question raised by some friend that wonders why the Moline Tool Co. was not mentioned along with the producers of the melting equipment which was engineered by the Ajax Electrothermic Corp. You understand we are not criticizing you for omitting the name of the Moline Tool Co. The only thing is we do like to have our friends know something of our range of activity in building production equipment. *C. R. Roeborough, President, Moline Tool Co., Moline, Ill.*

Cutting Material

Sir:

In your newsfront section of the Dec. 30 issue, there was an item about a new type chromium-carbide cutting material. I would like to obtain further information on the source, properties, and composition of this material. Any data you may have available will be appreciated. *R. B. Fischer, Battelle Memorial Institute, Columbus, O.*

More details on new type cutting material may be obtained by contacting the Allegheny Ludlum Steel Corp., 2020 Oliver Building, Pittsburgh 22, Pa.—Ed.

Vacuum Melting

Sir:

Please send me two sets of tear sheets on the article "Special Report—Vacuum Melting Gaining" which appeared in your Dec. 9 issue. *R. J. Zale, Asst. to the Sales Manager, Steel Div., Firth Sterling, Inc., Pittsburgh.*

SIMONDS

INDUSTRIAL
CUT GEARS

LARGE OR SMALL
HEAT TREATED OR
PLAIN



SIMONDS has over 60 years' experience in cutting quality industrial gears. We can supply any type of gear in

cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite in a full range of sizes adaptable to the material. Also heat-treated, case or flame hardened gears of carbon or alloy steel. Send us your requirements for quotation.

**Custom
GEAR CUTTING**



QUALITY
GEARS
FOR OVER
60 YEARS

SPUR GEARS
BEVEL GEARS
MITRE GEARS
WORMS WORM GEARS
RACKS PINIONS

Also stock carrying distributors
of Ramsey Silent Chain
Drives and Couplings;
and industrial V-belts.

SIMONDS
GEARS

THE
SIMONDS
GEAR & MFG. CO.

LIBERTY ST 25TH

PITTSBURGH 22, PA.



Cheapest Way to Give a Catalyst Nine Lives—or More!

COStLY vacuum cleaning operation for a Western oil refinery was sucking hot catalyst from the regenerator of their fluid cracking unit. First flexible metal tubing, then steel pipe was used to conduct the extremely abrasive particles to the storage tank under 18" vacuum. But the tubing pulled apart in as little as two minutes. The pipe failed in only 48 hours.

The G.T.M.—Goodyear Technical Man—recommended a special dry materials hose with a highly heat- and abrasion-resistant tube and full-faced, built-in flanges. At last report, this designed-to-the-job hose had served

a total of 144 hours and looked good for much more.

Hose is a specialty of the G.T.M. He has over 800 types in actual production—hundreds more under development—all designed to lower your hose costs. You can benefit from his experience by contacting your Goodyear Distributor or Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."

SPECIAL DRY MATERIALS HOSE by

GOOD YEAR
THE GREATEST NAME IN RUBBER

fatigue cracks

by William M. Coffey

Attention, Metallurgists

Here's a real opportunity for our family of IRON AGE metallurgists. Just don't forget, we're the first to tell you.

The Gravity Research Foundation, New Boston, N. H., for 6 years has been busy trying to find a way to harness gravity. From the first they believed down there that a differential must be discovered in order to make a gravity motor. Furthermore—with the possible exception of using power for a "self-starter" as in the case of the automobile—they insist that no outside power be used. In other words, any acceptable motor must operate as "perpetual motion" using only gravity or some supernatural force as power.

This requires and awaits the discovery of an insulator, deflector or absorber of gravity in order to bring about such a differential. The Foundation feels that this insulator, deflector or absorber may be a new alloy. Hence the Foundation is especially anxious to have metallurgists be on the look-out for such a discovery.

Such an alloy would have potential uses that stagger the imagination. As the Foundation points out it could even be used to decrease the gravitational pull on airplanes to reduce accidents, perhaps by serving as a "skin" with which all completely pressurized airplanes can be covered.

Why, you ask, is Fatigue Cracks interested in this? Because we know if any metallurgists can do this, our IRON AGE metallurgists can, and if we can put them or one of them on the road to fame and fortune we can say we did our part and we want some of the fortune, too. Just send the money, not the alloy.

Puzzlers

Here's a roundup of puzzler winners and answers.

Dec. 16 puzzler, the HARD

puzzler. Answer: A-3; D-6; E-5; H-1; L-7; O-0; P-2; R-8; U-4; Z-9. Winners: Russ Willis, Meslow F. Sienicki, C. A. Johnson, D. L. Dunning, H. Grimes, Mel Tudor, George Frederick, Mrs. Robert Moncrief, W. W. Bigelow, Harry Schuehler, W. L. Jackson, Austin Phelps, Russell Cress, Mildred Chapman, E. J. Shaver, Norman Osborne, Emil Blazina and Jack Davis, William Clifton, C. W. McKinley, Joseph Darby, Charles Limerick, Mrs. C. H. Pointer, I. M. Darcy, Joe Brugman, C. M. Dahlen, Stanley Robinson, Carson White, S. G. Hancock, Lawrence J. Hegeman, James H. Dempsey, Ole Ridge, John E. Langham, Warren Sturtevant, Ken Hofer, Charlsie and the G. S. C. Corp., Stanley G. Yates, A. H. Peirce and Warren Giles. WOW! Many old friends and, we hope, some new ones. Should we make 'em this easy all the time?

The English translation of our Latin verse (same issue) goes like this:

Oh see, Willie, see her go
Forty buses in a row.
Oh no, Billy, they is trucks.
What is in them? Cows and Ducks

. . . and our scholars turn out to be Nicholas Monsarrat, Choseff Chay Dahrbee and Meslow Sienicki.

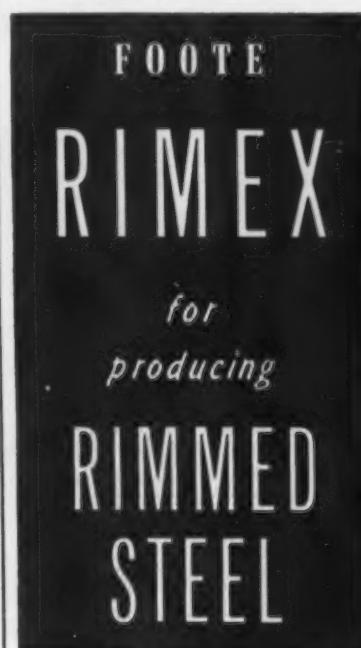
Dec. 23 puzzler, the crazy one about the crazy-shaped race track. Answer: 479.137 feet. Winners: Oldtimers and experts all, Nora LaDow, C. W. McKinley and C. M. Houston. (It looks familiar to me, too.)

New Puzzler

Many thanks to Mr. C. M. Houston of above fame for this one:

From one-half of a pile of cubic blocks on the floor, you can form one large cube, and then from the remainder, form a square, one block high, around the large cube. How many blocks are in the pile? We want only the smallest number.

a
significant
advance



This industry-proved steel additive reduces the cost of producing rimmed steel, with these advantages:

FOOTE
RIMEX*

1. Improves rimming action
2. Minimizes ingot growth
3. Fumes not obnoxious
4. Improves steel quality

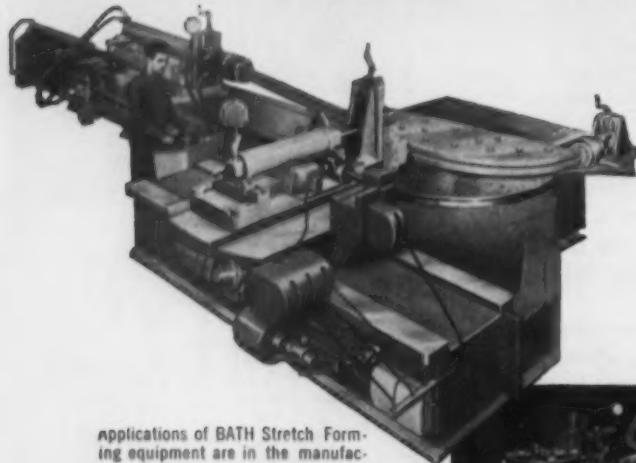
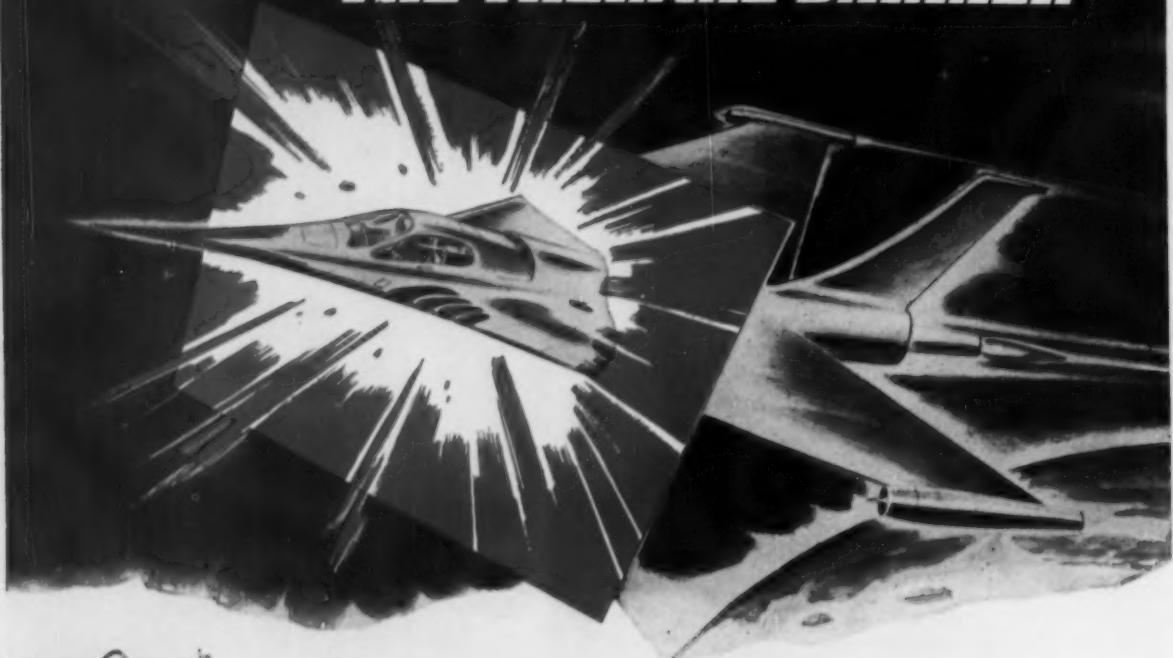
Information and prices upon request.

*Registered Trade Mark



438 Eighteen W. Chelten Bldg.
Philadelphia 44, Pa.

NEXT... THE THERMAL BARRIER



Applications of BATH Stretch Forming equipment are in the manufacture of air frame members and jet rings for the aircraft industry. VERSATILITY, PRECISION . . . AND SAVINGS . . . are offered only in the BATH process of forming.



Aeronautical scientists are up against the terrific heat problem in cracking the THERMAL BARRIER. Heat generated by friction at supersonic speeds not only weakens metal, but surrounds the pilot in a "St. Elmo's Fire". CYRIL BATH Stretch Forming Methods are playing an important roll in accurately forming the new alloy metals to meet tomorrow's problems today.

Complete literature is available on the CYRIL BATH Stretch, Radial Draw and Compression Forming methods. Send for YOUR copies . . . NOW.



32320 AURORA ROAD • SOLON, OHIO
(LOCATED IN THE GREATER CLEVELAND AREA)

MANUFACTURERS OF RADIAL DRAW FORMERS • DIES • TOOLS • PRESS BRAKES •
TANGENT BENDING SEQUENCE PRESSES • PRESS TYPE BRAKES • SPECIAL MACHINES



dates to remember

JANUARY

TRUCK TRAILER MANUFACTURERS ASSN., INC.—Annual convention, Jan. 27-29, Boca Raton, Fla. Association headquarters are at Room 710 Albee Bldg., Washington.

FEBRUARY

CUTTING TOOL MANUFACTURERS ASSN.—Annual meeting, Feb. 2, Detroit Yacht Club, Detroit. Association headquarters are at 416 Penobscot Bldg., Detroit.

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual meeting, Feb. 14-17, Conrad Hilton Hotel, Chicago. Institute headquarters are at 29 W. 39th St., New York.

EXPOSITIONS

NATIONAL ASSN. OF CORROSION ENGINEERS—Annual meeting and Show, Mar. 7-11, Palmer House, Chicago. Association headquarters are at 1061 M & M Bldg., Houston.

AMERICAN SOCIETY FOR METALS—Western Metal Exposition and Congress, Mar. 28-Apr. 1, Pan Pacific Auditorium, Los Angeles. Society headquarters are at 7291 Euclid Ave., Cleveland.

NATIONAL MACHINE TOOL BUILDERS ASSN.—Machine Tool Show, Sept. 6-17, International Amphitheatre, Chicago. Association headquarters are at 2671 E. 102nd St., Cleveland.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Founding Anniversary meeting, Feb. 16, New York. Society headquarters are at 29 W. 39th St., New York.

DROP FORGING ASSN.—Winter Industry meeting, Feb. 17-18, Statler Hotel, New York. Association headquarters are at 605 Hanna Bldg., Cleveland.

MARCH

PORCELAIN ENAMEL INSTITUTE—Pacific Coast conference, Mar. 10-11, Biltmore Hotel, Los Angeles. Institute headquarters are at Dupont Circle Bldg., 1346 Connecticut Ave., N. W. Washington, D. C.

AMERICAN SOCIETY OF TOOL ENGINEERS—Annual meeting, Mar. 14-18, Shrine Auditorium and Exposition Hall, Los Angeles. Society headquarters are 10700 Puritan Ave., Detroit.

STEEL FOUNDERS' SOCIETY OF AMERICA—Annual meeting, Mar. 14-15, Drake Hotel, Chicago. Society headquarters are at 920 Midland Bldg., Cleveland.

NATIONAL ASSN. OF WASTE MATERIAL DEALERS, INC.—Annual convention, Mar. 20-22, The Conrad Hilton Hotel, Chicago. Association headquarters are at 271 Madison Ave., New York.

INTERNATIONAL ACETYLENE ASSN.—Annual spring convention, Mar. 22-24, Shamrock Hotel, Houston. Association headquarters are at 30 E. 42nd St., New York.

AMERICAN MACHINE TOOL DISTRIBUTORS ASSN.—Spring meeting, Mar. 25-26, The Greenbrier, White Sulphur Springs, West Va. Association headquarters are at 1900 Arch St., Philadelphia.

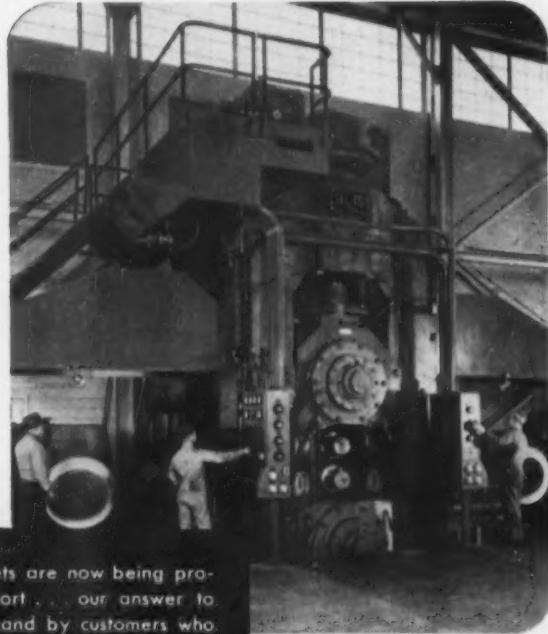
STEEL SHIPPING CONTAINER INSTITUTE, INC.—Annual meeting, Mar. 29-31, Biltmore Hotel, Palm Beach, Fla. Institute headquarters are at 600 Fifth Ave., New York.

APRIL

AMERICAN HARDWARE MANUFACTURERS ASSN.—Spring meeting, Apr. 10-14, Palm Beach, Fla. Association headquarters are at 342 Madison Ave., New York.

NOW... COLD-ROLLED SHEETS FROM

Newport Steel



Cold-rolled sheets are now being produced at Newport... our answer to a long-time demand by customers who find our hot-rolled products meet their most exacting requirements in quality, economy and service. These sheets are being rolled on a reversing cold mill just installed as part of our continuing program of expansion and modernization. Seventy years old in experience, new in facilities and methods, Newport is strategically located in the heart of the nation's greatest industrial growth—a dependable source for all the products listed here. You will profit by discussing your requirements with Newport before you buy more steel.

PRODUCTS OF NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Galvanized Sheets
Galvannealed Sheets
Colorbond Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Roofing and Siding
Eave Trough and Conductor Pipe
Culverts

ECONOMICAL WATERAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel



CORPORATION

NEWPORT, KENTUCKY

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Quick Change of Set-Up Makes

... features of



157 -

Landis 10" x 24" Type CH Universal Grinder

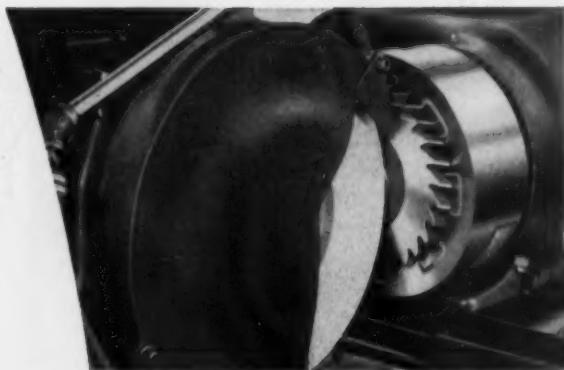
LANDIS

precision grinders

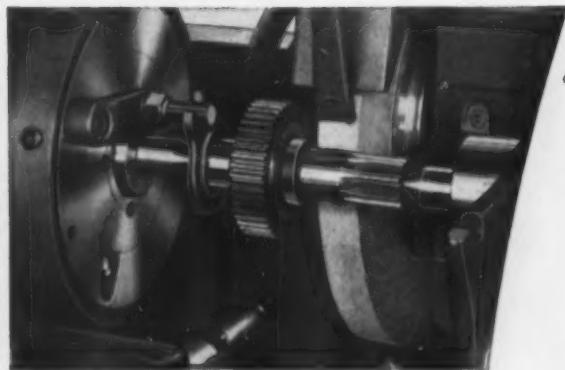
Modern operating features of Landis Universal Grinders permit quick set-ups. This gives flexibility and economy of operation for small lot manufacturing, toolroom and maintenance work. Write for Catalogs. Landis Tool Company, Waynesboro, Pennsylvania.

Small Lot Grinding Profitable

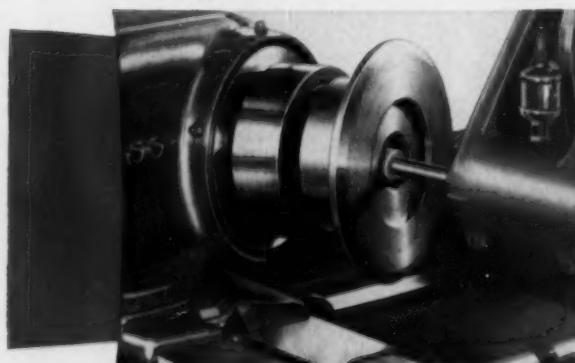
Landis Universals cut costs on precision grinding operations



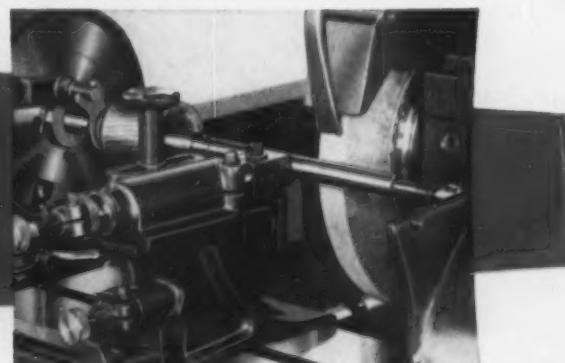
FACE GRINDING—magnetic chuck and low, compact swivelling headstock. Operator can make fast selection of correct speed.



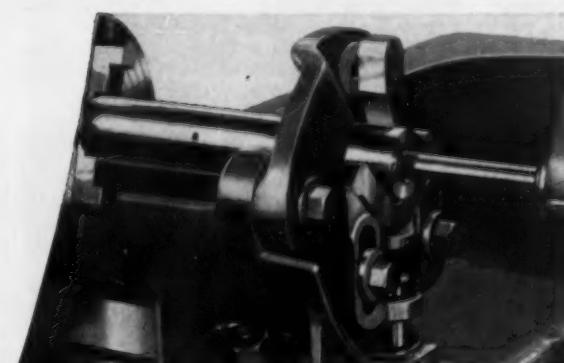
INFEED GRINDING—precision wheel feed and Micro-sphere wheel spindle bearings give accurate results and fast sparkout.



INTERNAL TAPER GRINDING—modern swing-type fixture provides quick changeover from external to internal grinding operations.



TRaverse GRINDING—use of automatic wheel feed saves time on short run traverse grinding jobs.



INTERNAL GRINDING—deep hole inside long work piece held in chuck and center rest. Wide variety of quills and wheels available.



TAPER GRINDING—tapers are easily ground. Piece shown has taper of 14° included angle. Wheelbase and headstock also swivel.

**Are you BARRED
from planned assembly savings
BY A THREAD?**

Screws can be "trouble-bent" in many ways. Most thread faults like those listed here are invisible, but their effects (job slowdown, parts spoilage, high reclamation expense, hidden weakness) show clearly in assembly costs and customer complaints.

That's why P-K quality standards have been set so high—to make sure you get Self-tapping Screws that are not only threaded, but headed, pointed and heat-treated with one purpose in mind, to keep your assembly lines trouble-free.

For information on any fastening problem, talk to a P-K Assembly Engineer. Parker-Kalon Division, General American Transportation Corporation, 200 Varick St., New York 14, Chicago Warehouse, 4331 West Lake St., Chicago 24.



P-K STANDARDS PROTECT
you against the thread faults illustrated and many others that will cause assembly trouble and weak fastenings. They don't "get by" P-K inspectors—that's why all P-K Self-tapping Screws can be "Guaranteed First Quality."



EASTMAN KODAK speeds up assembly of the Kodalite Flashholder by using P-K Self-tapping Screws. Troublesome tapping of small holes in plastic was eliminated. Screws are driven with hopper-fed automatic machines, removing necessity for tedious screw handling and placement. Two P-K Phillips



Head Type F Screws fasten a cover mounting bracket to the flashholder case (right) and three more fasten the metalized Tenite II reflector to the case (left). Case is a thermo-setting phenolic. Screws hold firmly under all stresses of normal use, can be removed for attachment of new reflector.

PARKER-KALON®
The First SELF-TAPPING SCREWS



IN STOCK . . . see your nearby P-K Distributor





Designed and Built by

YOUNGSTOWN WELDING & ENGINEERING CO.

For U. S. STEEL'S FAIRLESS WORKS

Three 15-Ton WELDCO MECHANICAL TUBE PICKLERS, like the one shown above, assure fast, efficient, low-cost pickling at the new Fairless Works. If you want uniform pickling, better finish, and big savings in manpower and maintenance, investigate WELDCO's complete line of Mechanical Picklers—for Bars, Tubing, Coils and Sheets.

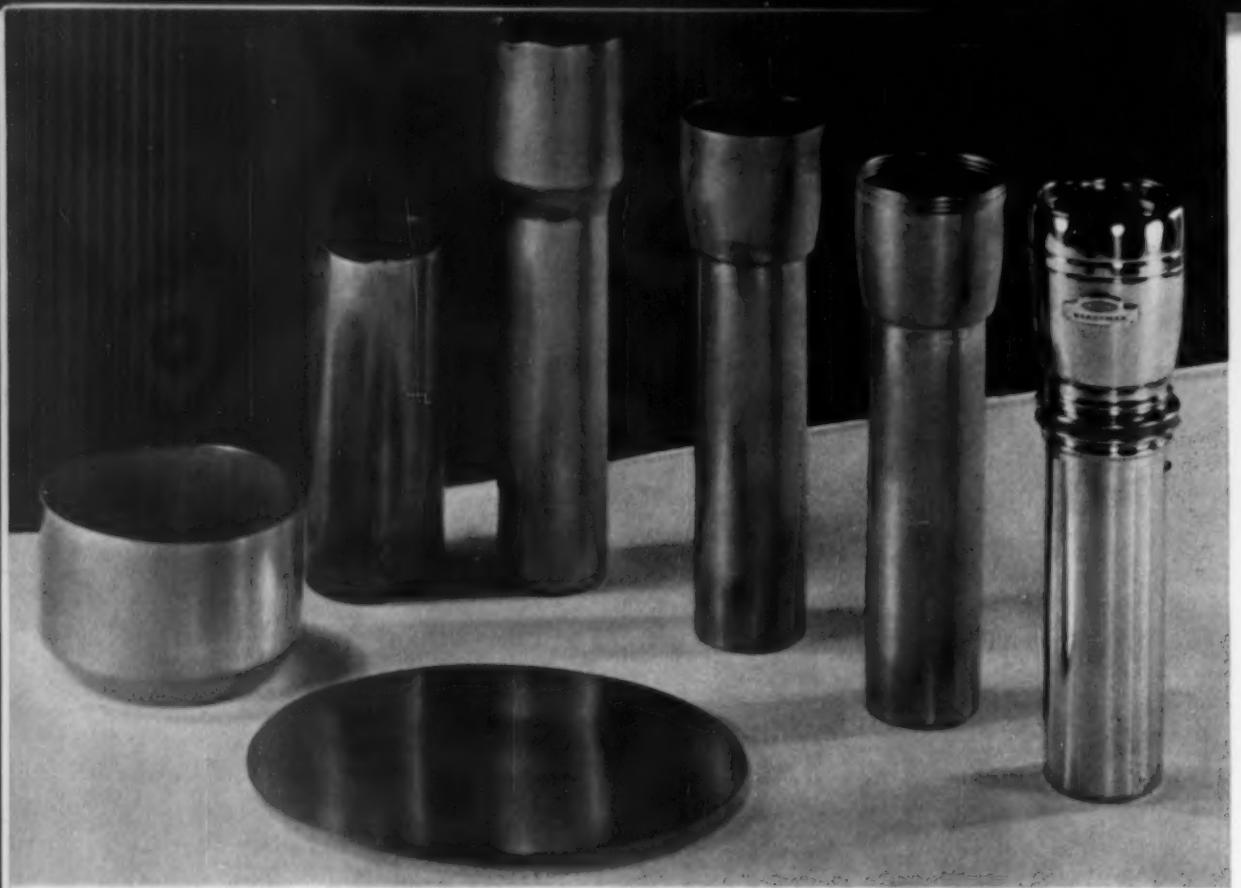
Other WELDCO Pickling Products include:

Hooks, Crates, Baskets, Racks, Chain, Steam Jets, and Accessories.

WELDCO

**THE YOUNGSTOWN WELDING
& ENGINEERING COMPANY**

3762 OAKWOOD AVE. YOUNGSTOWN 9, OHIO



1. The Evolution of a flashlight, from electro-copper coated steel strip to finished product . . .

\$100,000-A-Year Production Idea

Take a stroll through the Blake Manufacturing Division of Ray-O-Vac Company. Then you will understand how this firm arrived at its slogan: "Miracles in Metal."

In its plant at Clinton, Massachusetts, Ray-O-Vac produces the largest line of flashlights in the world, all of modern styles and designs, ranging from pocket models to five-cell spotlights and Hunter Lanterns. The volume moving off the production lines, wrapped and packaged for display, runs into the millions each year.

From start to finish, the plant is modernly equipped and efficiently organized. Through experience and ingenuity, it has developed production techniques that are in many ways unique. For example, take the manufacture of flashlight cases.

On models where brass traditionally has been most used, Ray-O-Vac is now making cases of steel. Because both types of cases are chrome finished, you can't tell a brass flashlight from a steel one by looking at it. They are both corrosion resistant, highly polished, and beautifully contoured.

But try standing on one. The brass

case flattens out. The steel case doesn't. Ray-O-Vac has come up with a rugged product that gives it a quality advantage in competitive markets. The interesting fact is that it has done this with production savings that run from 17 to 29 per cent.

• **How It Was Done**—As in most worthwhile ventures, the transition wasn't made overnight. Blake Division engineers first began experimenting with plain drawing quality steel. The depth of the draw required for a flashlight case is an extremely severe one. No matter how they designed their dies or regulated the drawing cycle, they couldn't find a plain steel that would do the job.

Next, they called in the specialty strip men from Thomas Strip Division of Pittsburgh Steel Company. Thomas development engineers joined Blake's, and together they began exploring the possibilities of special drawing quality steel with an electrolytic coating of copper. The copper coating provides a good die lubricant and a good base for chrome plating.

One year and nine trial lot ship-

ments later, they came up with the answer. Today, Blake is using .020 gage non-scalloping deep drawing quality strip steel produced by special processing techniques developed at Thomas, electro-copper coated on both sides, $6\frac{1}{16}$ inches wide in 450-pound coils.

This may sound complicated, but specialty strip steel such as this is the forte at Thomas, and they can produce it with consistently uniform quality that gives Blake a maximum yield from every coil.

• **In Production**—To watch these coils of electro-copper coated strip become flashlight cases at Blake gives you the impression that if there is nothing miraculous involved, at least the engineers were closely akin to technical wizards.

The coils are fed into a double action press. It cuts a round blank from the strip that is 6.398 inches in diameter. From there, in a series of four drawing operations without annealing, this round, flat disc of cold steel becomes a single-piece flashlight case $7\frac{1}{2}$ inches long with a battery case diameter of 1.517 inches.



2. Begins at this double action press that blanks out a circular disc of 1.945 inches (photo No. 1).



3. The Cup Becomes a Tube as the cold steel flows under tremendous pressure, then shaped into a...



4. Flashlight Case on a horizontal press that also forms the flashlight head.

and a formed head with a diameter of 1.945 inches (photo No. 1).

As the first press has a double action (photo No. 2), it also makes the first draw. Here's where the "Miracles in Metal" begins as the steel flows under tremendous pressure, producing a smooth-surfaced and even-edged cup $3\frac{1}{2}$ inches deep with a base diameter of 3.480 inches. The redraw press (photo No. 3) makes two draws with the maximum reduction on each. It turns out a closed end tube 5 inches long and 1.954 inches in diameter.

The tube is then fed to a horizontal redraw press (photo No. 4) that makes a further reduction, forming the cell case and head. The head is trimmed, shaped, roll threaded and knurled. Finally, the case is given a heavier copper plating, buffed and polished, chrome plated, then delivered to the assembly lines (photo No. 5).

Compared to the fabrication of cases with brass, electro-copper coated strip is fabricated more rapidly and requires less processing. Two annealing and pickling operations and one redraw have been eliminated. Fewer tubes need to be stocked ahead of press operations. From the first press through the last forming operation, Blake's equipment produces steadily at a rate of about 1,400 pieces an hour.

The Pay-Off—Savings, including the lower initial cost of electro-copper coated steel strip compared to brass, range from 3 cents to 6 cents per flashlight case on models produced from steel. On three popular models alone, these savings amounted to more than \$100,000 last year.

Add to this the important fact that Ray-O-Vac is building a better quality flashlight with advantages

that increase sales, and the slogan "Miracles in Metal" takes on increased significance.

If you are fabricating products from more expensive metals, why not consider the use of Thomas pre-coated strip steel? Perhaps you can accomplish similar savings and improve your product.

Thomas strip begins with good steel of correct analysis in a variety of tempers. It is cold rolled to exacting tolerances. Then it can be coated electrolytically with zinc, lead alloy, copper, brass, nickel or chrome... hot dip tin and lead alloy coated... or lacquer coated in different colors. It offers the luster of planished or buffed finishes. Altogether, Thomas produces the widest range of strip steel specialties in the industry.

Thomas Strip is more than a product, it is a production idea. Why not call a representative to discuss your problems with you and offer suggestions. You will find him ready to give you prompt, personal service without obligation. Write for descriptive literature.



5. Finished cases receive a chrome plating. Assembly of switches, lens rings, springs, caps, etc. is done on one of eight lines such as this, producing at rates up to 30,000 packaged flashlights a day.

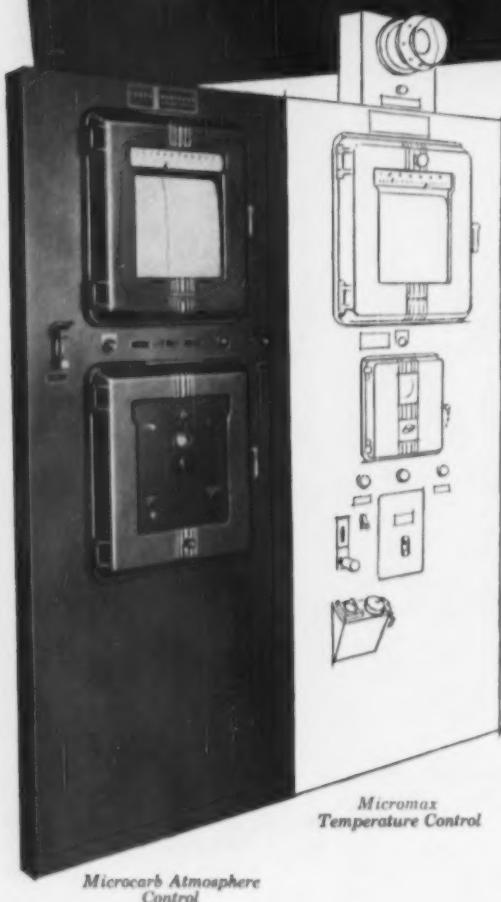
"Everything New But The Name"
Thomas Strip 
 Division
Pittsburgh Steel Company
 Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Atlanta • Chicago • Cleveland • Columbus • Dallas
 Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh
 San Francisco • Tulsa • Warren, Ohio. PLANTS: Monessen, Pa. • Aliquippa, Pa. • Akron
 Los Angeles • Unionville, Conn. • Warren, Ohio • Worcester, Mass.

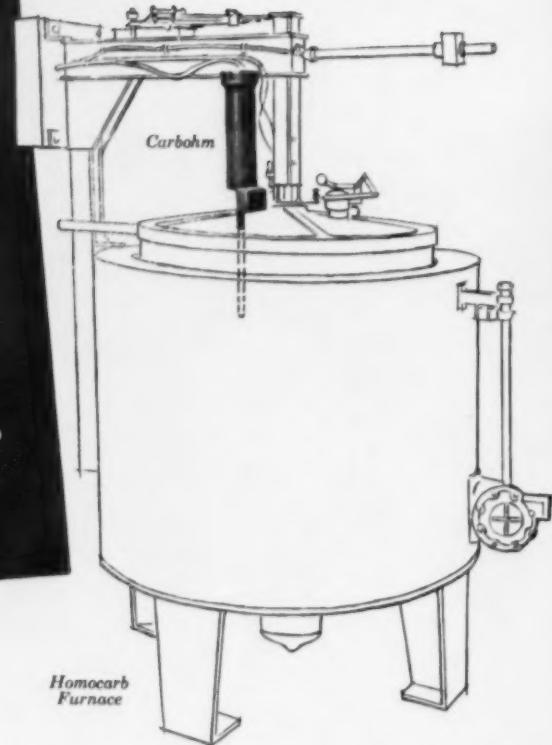
PRINCIPAL PRODUCTS: Hot and Cold Rolled Strip and Sheets • Strip Specialties • Seamless
 Tubular Products • Wire and Wire Products • Chain-Link Fence • Cargotainers • Steeltex

Want greater versatility

FOR YOUR
HOMOCARB® FURNACES?



Microcarb Atmosphere Control



Homocarb Furnace

... you can get it by adding
Microcarb Atmosphere Control

The addition of Microcarb Control broadens the scope of the Homocarb Method to handle more types of heat treatments and steels than ever before. Microcarb Control provides automatic control of the active carbon in the furnace atmosphere . . . a control which is simple to set, and which draws a continuous record of percent carbon for each heat-treat cycle.

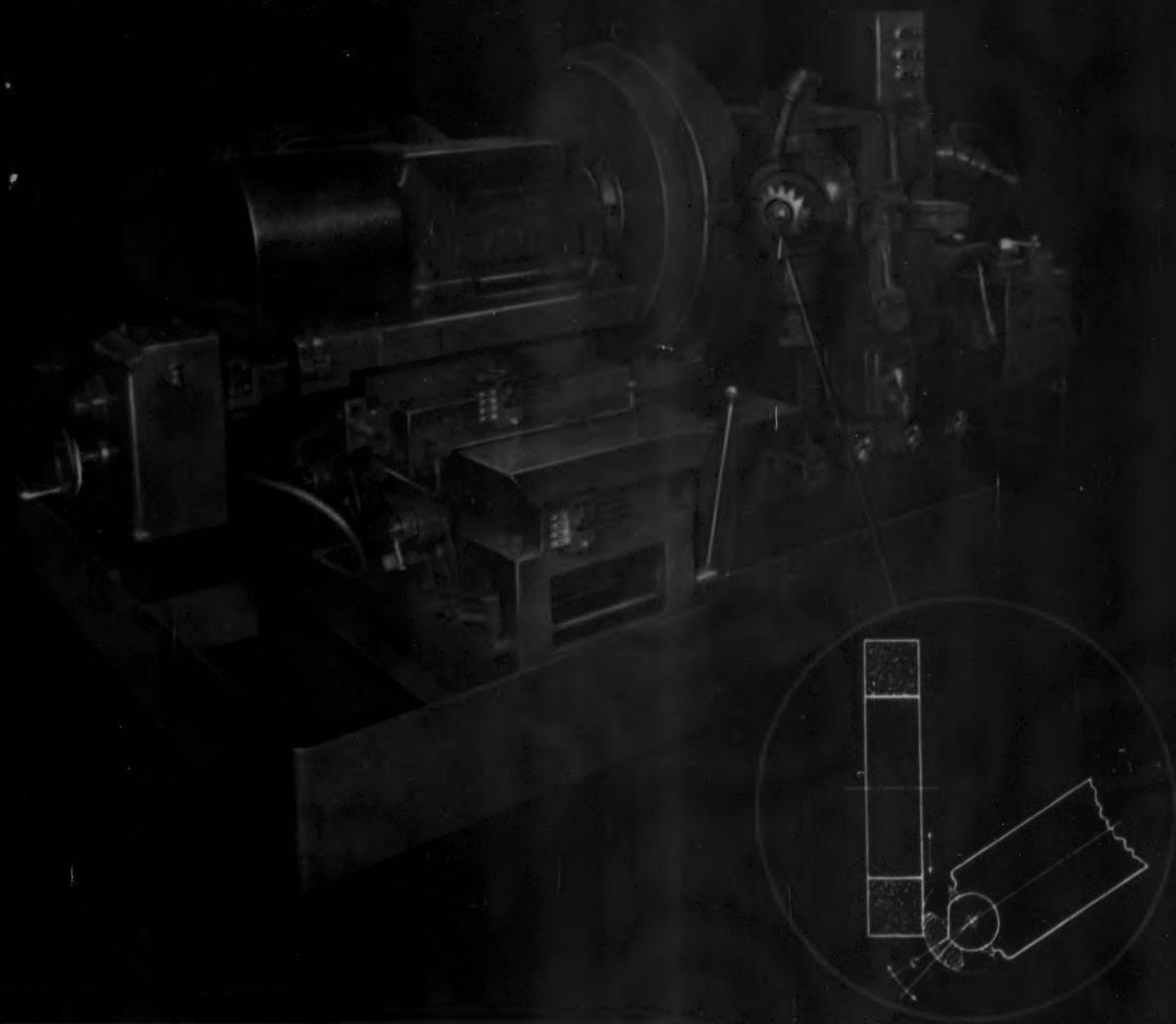
With Microcarb Control it is now possible to: 1. harden steels under a protective atmosphere which neither adds carbon nor decarburizes the surface of the steel; 2. homogeneously carburize thin section parts from a low carbon steel to a specified higher carbon content; 3. restore decarburized surface layers to a specified carbon content to match the core; and 4. case-carburize steels to controlled maximum surface carbon content.

Microcarb Control can be added to your already-installed Homocarb furnaces by your own maintenance crew. For more information just write us at 4956 Stenton Ave., Philadelphia 44, Pa., and ask for Catalog TD4-620(2).

LEEDS  **NORTHRUP**
Instruments automatic controls • furnaces

NEW DISC GRINDING METHOD GENERATES CURVED SURFACE

Production of rock-bit side cutters speeded by Gardner tooling



JOB DATA

MACHINE TOOLING

ABRASIVE PRODUCTION

TOLERANCE STOCK REMOVAL

Gardner 726-26" Single Spindle Grinder

Hydraulically oscillating work carrying fixture with hydraulic work clamping

26" x 3" x 16" disc—Gardner Wire-Lok®

45 pieces per hour of spherical surface on rock-bit side cutter; formerly ground straight .010" for uniformity

Approximately $\frac{1}{4}$ " of hard surfaced steel stock

For assistance with any kind of surface grinding problem, send us blue prints for production estimates and tooling suggestions.

GARDNER MACHINE COMPANY

414 Gardner St., Beloit, Wisconsin, U.S.A.

GARDNER

*precision
disc
Grinders*

1

TWO SOLUTIONS TO THE CHALLENGING PROBLEMS OF

2

UNITED STATES PIPE & FOUNDRY CO.

Special Products Division

BURLINGTON, NEW JERSEY



SALES OFFICES: LOS ANGELES, CHICAGO, ST. LOUIS, CLEVELAND, DETROIT, PITTSBURGH, HARTFORD, BURLINGTON

**SOUNDNESS
AT 2150 F.**

HIGH TEMPERATURE

**SURFACE
AT 1400 F.**

1 Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum — a test only the ultimate in soundness and quality could survive.

2 The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

**"METAL MOLD"
CENTRIFUGAL
CASTINGS**

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter	4" to 36"
Wall Thickness	3/8" and up
Length	Up to 16' in the "as-cast" condition
Type of Stainless Cast	All Standard AISI and ACI grades of ferritic and austenitic stainless plus "Special" types



When SPECIFY REPUBLIC



Baked-enamel applied to Republic Electro Paintlok gives this bakery goods display a customer-attracting appearance and longer service life. These zinc-plated steel sheets are chemically treated to take paints, lacquers, synthetic enamels—and hold them for years. If you paint on steel, consider Electro Paintlok for making your fabricated steel products more attractive, more serviceable, at less cost.



Revenue increased 15% to 40% when these rental lockers were made from Republic ENDURO Stainless Steel. Yet, costs were only 9% more than for carbon steel, painted. ENDURO's bright, attractive finish generates "self". No other material offers the designer so many advantages. Republic makes ENDURO in all commercial forms. Republic metallurgists will help you apply its bonus benefits to your product or process.

This rear axle assembly must withstand shock and vibration at high speeds. Republic "Nylok" Nuts are used to assure positive locking even under severe vibration. The nylon plug in one face forces the nut tight against the opposite threads of the stud as the nut is turned on.

Republic "Nylok" Nuts lock whether seated or not. They go on easily. Either end is up. Feed them automatically at full production speed. Or manually for piece-work. No special tools, lubricants or techniques are needed.

They cut maintenance costs, too. Republic "Nylok" Nuts are easily backed off for inspection of parts. And, then can be re-used.

REPUBLIC

World's Widest Range of Standard



vibration is a problem...

"NYLOK" NUTS!

12 WAYS BETTER

Assemble from either end • Can be re-used • Non-galling • Best wrenching characteristics • One-piece • Cold-forged • Won't damage threads • No special tools • Lock in any position • No special know-how • No lubricants needed • Ideal for mechanical feeding

SIZES

Finished Series tapped $\frac{1}{4}$ " through 1"
Finished Thick Series tapped $\frac{1}{4}$ " through $\frac{1}{2}$ "
Heavy Series tapped $\frac{1}{4}$ " through 1"

Write for a sample indicating size required.

"Nylok" *Nuts are only one of more than 20,000 types and styles of high quality fasteners made by Republic for all industries.

*U. S. Pat. No. 2,462,603 and No. 2,430,694 and pending applications.

STEEL

Steels and Steel Products



These gears were made at less cost from Republic Cold Drawn Special Sections. Much of the machining was eliminated because the sections already were formed to the predominating cross-section of the part. Parts benefit from the increased physicals produced by cold drawing. The bright smooth finish rarely requires further machining. Send samples or blueprints of your parts. We will tell you whether you can save money—and how much—by making your steel parts from Republic Special Sections.

REPUBLIC STEEL CORPORATION
3104 East 45th Street,
Cleveland 27, Ohio



Please send a sample "NYLOK" Nut Size _____
Please send literature on: Electro Paintlok Sheets
 Enduro Stainless Steel Cold Drawn Special Sections

Name. _____ Title. _____

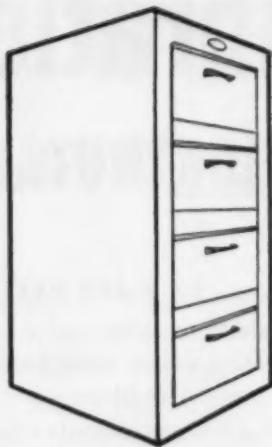
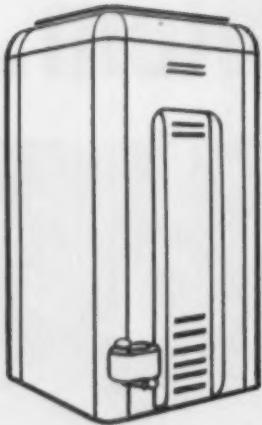
Company. _____

Address. _____

City. _____ Zone. _____ State. _____

E-1007

**Speed your production as this
with new **DUOTONE**
by Lowe Brothers**



A large manufacturer of theater seats wanted to step-up production of seat backs by eliminating back-tracking and double-handling in the finishing process. Lowe Brothers "Finishing Specialists" developed an amazingly fast spraying, solid covering (one coat!), quick setting enamel for his product. Besides greatly speeding the flow of finished parts, this sensational new finish—Duotone Enamel—provided the best looking, longest wearing, most economical finish this manufacturer had ever used!

New Duotone Enamel is the ideal finish for a broad range of sheet metal products. It gives maximum beauty and wearability, yet keeps finishing costs at a minimum! □ □ □

This advertisement is based on facts from Lowe Brothers Case History files.

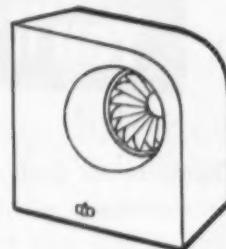


ENGINEERED QUALITY

manufacturer did...

ENAMEL

Extremely fast baking! Amazingly tough!



Check these important Duotone Enamel features • Dries in 15 minutes at 300° in a conventional oven—and in 8 minutes under infra-red! No orange peel! • Available in any degree of gloss—wide color choice. • It's a modified alkyd resin type enamel. • Sets a new standard for wearability! Practically impossible to mar or scratch! • Resists perspiration and skin oils. • Duotone keeps material cost to a minimum! Just one coat (only $\frac{1}{2}$ mil thick) covers bare metal surfaces perfectly with an adequate protective film . . . Duotone may save you plenty in 1955! You pay nothing to find out. Write today for the full story.

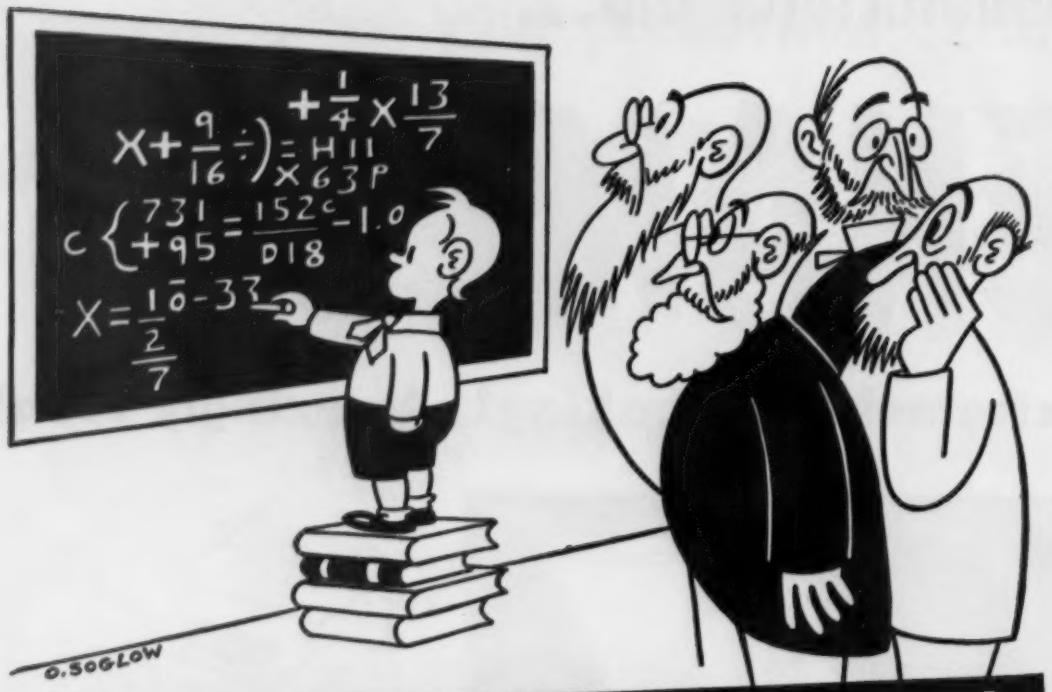
The Lowe Brothers Company • Dayton 2, Ohio • Industrial Division

LOWE Brothers

FINISHES FOR INDUSTRY SINCE 1870



District Offices: Atlanta • Boston • Dallas
Chicago • Jersey City • Kansas City



You'll be surprised at these figures!

Thanks to the thrift of employed Americans and the cooperation of 45,000 companies which have enrolled more than 8,000,000 men and women in the Payroll Savings Plan—

- Sales of E and H Bonds (H Bond is the current-income companion piece of the E Bond, sold only to individuals and purchased in larger denominations by executives) in 1954 totaled \$4.9 billion, a new peacetime record.
- Sales in 1954 exceeded *all redemptions* in that year of matured E Bonds and unmatured E and H Bonds by more than \$400 million—the highest net amount since 1949.

● Cash value of E and H Bonds outstanding reached a new record high of \$38.2 billion, a gain of \$1.5 billion in 1954.

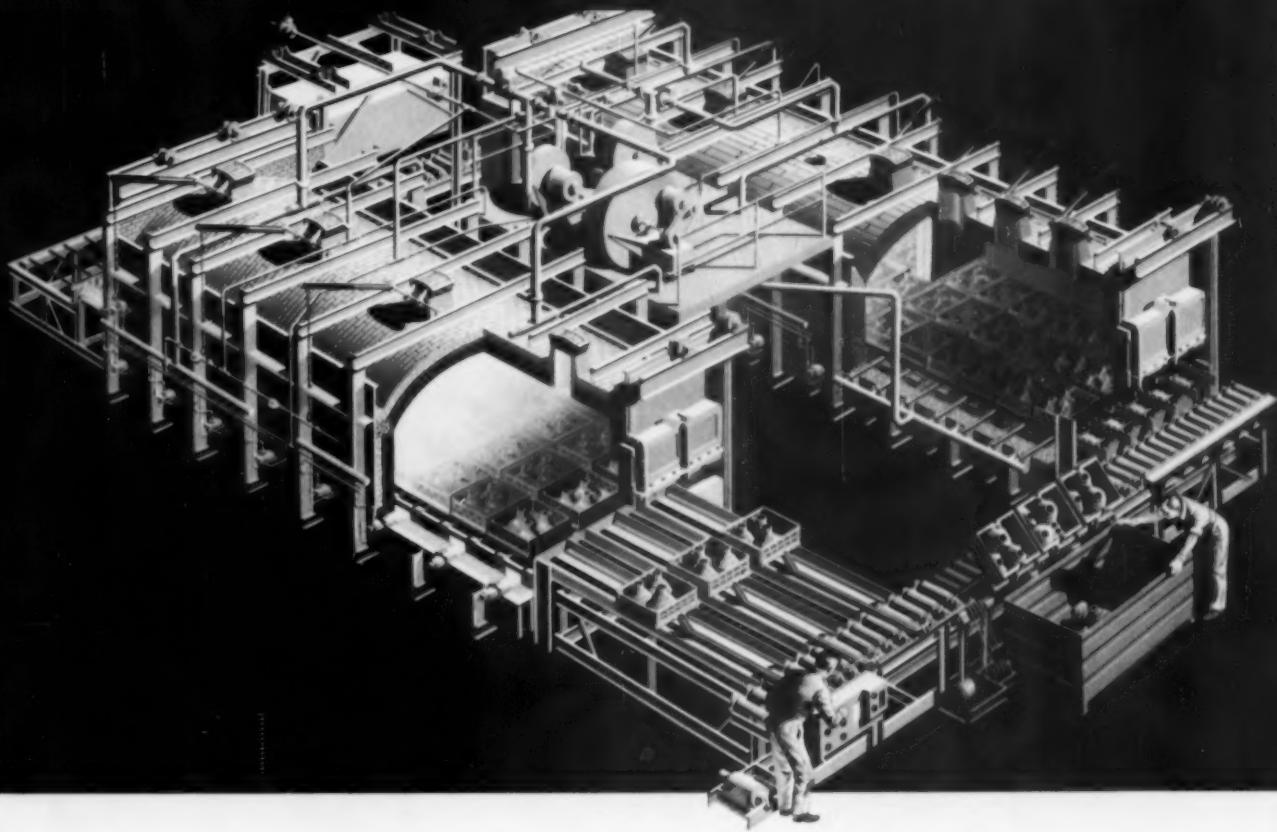
● This \$38.2 billion cash holding by individuals represents 14% of the national debt. Never before has the national debt of our country been so widely held.

These figures, far more effectively than mere words, tell the story of The Payroll Savings Plan—why it is good for America, why it is good for business. If you do not have the Plan, or if you have the Plan and your employee percentage is less than 50%, phone, wire or write to Savings Bond Division, U. S. Treasury Department, Washington, D. C.

The United States Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

The Iron Age





You get automatic, precise heat treatment plus high production with this Salem-Brosius furnace

You speed production—control heat treating cycles to close limits—achieve specified metallurgical and physical properties in forged parts with this Salem-Brosius furnace.

This is possible because time, temperature and material movement are automatically controlled to provide precise cycle annealing practice. Rugged construction and simplified design give you efficient operation with low maintenance.

Here is a typical cycle. Forged alloy steel automotive parts, such as clutch plates and drive pinions, are loaded into three trays and positioned in front of the furnace pusher on the left. The furnace takes over.

The trays move automatically into the heat and soak chamber where the parts are heated to 1700°F. and held at that temperature for a timed interval. Then they move to the next section and are control-cooled to 1200°F. at which moment they move to the final zone and are con-

trol-cooled to 500°F. At this time the trays are ejected to a transfer table from which they are automatically emptied into tote boxes.

An ingenious arrangement of recording controllers, fuel regulators, thermocouples, and air control valves automatically hold the temperature to within extremely close limits. Yet this precise furnace anneals as much as 4000 pounds of forgings per hour.

This furnace is typical of the efficient heat treating and heating furnaces designed and built by Salem-Brosius to increase your production and reduce your unit costs. The skill and experience of Salem-Brosius engineers recently were augmented by the acquisition of the George J. Hagan Company so that now you get the benefit of the combined abilities of both organizations to design, engineer and build fine furnaces when you specify Salem-Brosius. Write to us!

SALEM-BROSIUS, INC.

400 EAST CARSON STREET, PITTSBURGH 3, PENNSYLVANIA

IN CANADA: SALEM ENGINEERING LTD., 1525 BLOOR STREET WEST, TORONTO 9, ONTARIO

Here's How the Gisholt
HYDRAULIC SPEED SELECTOR

saves you time and money



SET CUTTING SPEED HERE

There is a "best" cutting speed for machining with every combination of material and tool. Set that cutting speed here by turning the knurled ring.

SELECT DIAMETERS HERE

The operator merely turns the handwheel to the diameter of each successive cut. The Selector automatically shifts to the proper spindle speed.

Instant shifts to any one of 12 spindle speeds make it easy for the operator always to use the most efficient cutting speed. Reduces cutting time to a minimum with no time-wasting calculations and no physical effort.

Actuated by a mere touch to the wheel,

the Speed Selector functions automatically, leaving the operator free to index the turret and present new tools to the work, thus reducing waste time between cuts. It's one of many features on Gisholt Turret Lathes that pay for themselves in a hurry.

GISHOLT
MACHINE COMPANY



Madison 10, Wisconsin

THE GISHOLT ROUND TABLE
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

The Iron Age Newsfront

Ford: First Target for GAW?

The notion grows in Detroit that Ford will be the 1955 automobile target for a Guaranteed Annual Wage. Bettors continue to favor a strike.

Standard, Special Machines More Versatile

The dividing line between standard and special machine tools is constantly becoming less marked. Standard machine tools are increasingly capable of performing specialized operations and vice versa.

Joint Action on Pickle Liquor Recovery

Several steel companies are now planning to put up the money for construction of a pilot plant pickle liquor recovery system. Some 10 or more companies are said to be participating in the joint effort to determine the worth of a European method of treating pickle liquor. A large steel fabricating and chemical company is licensee for the European process.

Future Bright For Oil Country Goods

Along with increased production of high tensile strength oil country goods, as announced recently by National Tube, 1955 is expected to see a considerably extended use of smaller diameter tube and casing. Tube in 4.5 in. diam is expected to show strong gains.

Torque Amplifiers on Farm Equipment

Torque amplifiers, after securing a foothold in the farm equipment market via the farm tractor, are proving their worth in other applications. Results obtained on grain combines, for instance, look very good even though the equipment used was designed for lighter applications.

Protects Fine Metal Finishes

A new coating is being used by producers of drawn parts to protect fine finishes. In one case the coating has been applied to buffed stainless strip to reduce scratching. Formed parts are handled easily in the plant without

marring. For outside shipment, parts are palletized without wrapping. The coating can be washed off with a light alkaline cleaner.

Assures Better Grinding Wheel Balance

A single plane dynamic balancing machine which operates on the principle of an electronic stroboscope is now being used to balance grinding wheels. The machine, recently developed in a joint research project, is expected to give new accuracy in the balancing of grinding wheels.

Cold Extrusion Progress Report

A \$7 million Army Ordnance contract for production of a special shell by cold extrusion has just been signed by a Midwest firm. The shell was formerly produced from two forged pieces, then machined to size. Now it will be cold extruded in one piece.

Hydraulic Press Trims Aluminum Forgings

Trimming of large aluminum forgings is now being done very successfully on a 2000-ton hydraulic press of special design. A cushion cylinder reduces the pressure setting as the slide passes through the last portion of the work stroke, eliminating the problem of break-through shock.

Stronger Plastic Being Tested

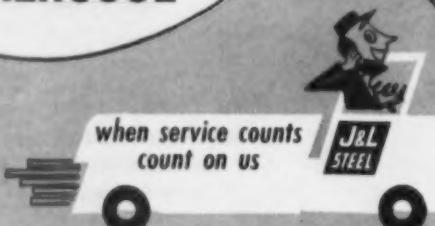
Polyethylene plastics with 50 pct better rigidity, greater corrosion resistance and higher tensile strength are under test by producers. This will be a major step in the battle against corrosion especially for the underground and overhead pipe fields.

Stud Driving: 20 Parts Per Minute

A new multiple-spindle stud driving-tapping machine eliminates the need for tapping cored holes in diecastings. Using a hydraulic power cylinder and a rack-and-pinion drive and lead screw, stud driving is accurate and positive. Multiple studs can be driven into a diecasting at the rate of 20 parts per minute.

going down
the drain...
need help?

Call your
nearest
**J&L STEEL
WAREHOUSE**



for a complete line of steels

SPECIALS: Jalloy (Abrasion and Impact Resistance) Jalten (High Strength—Good Formability—Lighter Weight) Junior Beams • Junior Channels • Jaltread Floor Plate • Tool Steels • Stainless Steels.

STANDARD PRODUCTS: Hot Rolled and Cold Finished Bars and Shapes. Structural Shapes • Carbon and Hi-Tensile Plates • Hot and Cold Rolled Strip and Sheets • Wire Products • "Precisionbilt" Wire Rope.

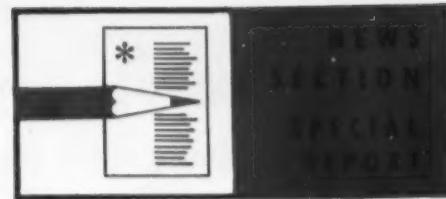
for service that solves your problems

TECHNICAL SERVICE: Experienced J&L Metallurgists to help you with analyses and recommendations.

FABRICATION SERVICE: Shearing, forming, torch cutting, blanking, to your specifications.

**J&L
STEEL**

Jones & Laughlin
STEEL CORPORATION — Warehouse Division



OXYGEN: Boosts Openhearth Output

**Inland Steel credits oxygen with 250,000-ton increase in capacity
... Firm now uses 180 tons of oxygen daily... Ups furnace output nearly 10 pct
... Economic use hinges on many factors—By K. W. Bennett.**

• WHILE OXYGEN in steelmaking isn't new, the new grin crop on users' faces is. When Inland Steel Co., Chicago, announced attainment of 5 million tons of annual capacity last week, mill men were agreeing that about 250,000 tons of the additional rating could be traced directly to oxygen use in openhearth melting practice.

Inland began using oxygen as early as 1947, two years ago had advanced its usage to, what seemed then, the comparatively strong figure of 50 tons daily. This year the figure has reached what appears to be a temporary resting place at 180 tons daily. Since Inland still isn't sold on the use of blast furnace oxygen, the company's use of the gas would appear to have hit at least a temporary plateau.

How It's Used

Early last year, Inland had completed equipment installations for two types of oxygen use in its No. 2 openhearth shop, a line of 24 openhearth furnaces rated at 170 and 200 tons, and standing shoulder to shoulder in a single line of openhearth capacity that is unique for its very length.

For 35 to 40 pct of the melt cycle in these furnaces, oxygen is supplied through the burner nozzles and provides oil-flame enrichment. In a second phase, decarbonization, oxygen is pumped directly into the bath during the last 2-3 hours of the melt cycle via a 20-ft lance inserted through the furnace door. As the lance tip is consumed, more lance is fed from its supporting dolly through the furnace door, keeping the tip

beneath the melt surface. No lateral motion is needed.

The 95 pct pure oxygen (higher purities have been tested but proven unnecessary) bubbles through the boiling steel converting excess carbon into gaseous carbon dioxide at a rate considerably faster than could be expected without the additional gas. Inland technicians estimate that currently they have gained 9 pct in ingot output per furnace hour, and that largely in the past 12 months. They are quick to add that the increase in output has been accompanied by no appreciable increase in normal furnace wear.

Openhearth men are pleased by

the output advance, but like to dwell on the benefits of oxygen in hearth cleanup and maintenance. About 5 pct of Inland's total daily oxygen consumption is used in an openhearth shop where equipment for oxygen steelmaking hasn't yet been installed. Here in this new line of four 250-ton furnaces the gas is providing an impurity-free method for burning out material from furnace floors with no damage to the furnace. Same cleanup procedure is used in other openhearts as well.

The 9-pct advance in ingot output per furnace hour can be regarded as a conservative figure.

The use of oxygen with the

IRON & STEEL: DECEMBER OUTPUT BY DISTRICTS

As Reported to the American Iron and Steel Institute

DISTRICTS	PIG IRON			FERROMANG. & SPIEGEL			TOTAL		
	Annual Capacity	Dec.	Year to Date	Dec.	Year to Date	Dec.	Year to Date	Pct of Capacity	
								Dec.	Year to Date
Eastern	17,261,056	1,091,330	11,991,852	25,471	203,485	1,106,801	12,195,137	75.6	70.6
Pitts.-Yngain.	29,501,270	1,089,557	x10,922,027	22,228	247,070	1,091,783	x20,089,087	75.6	65.0
Cleveland-Detroit	8,714,000	866,982	8,114,491			586,082	6,114,491	86.0	70.2
Chicago	16,371,250	1,295,811	12,546,077			1,205,811	12,546,077	86.9	78.6
Southern	6,273,000	421,817	4,849,816	7,004	106,266	428,811	4,986,002	80.7	79.0
Western	3,079,200	281,212	2,795,319	5,002	12,914	286,214	2,808,233	81.0	72.4
TOTAL	82,001,300	5,826,720	x8,119,382	59,793	966,730	5,386,813	x8,088,117	80.4	71.8

DISTRICTS	TOTAL STEEL						ALLOY STEEL*		
	Annual Capacity	Dec.	Year to Date	Pct of Capacity		Index**			
				NET TONS	Dec.	Dec.	Year to Date	Dec.	Year to Date
Eastern	25,864,000	1,678,861	17,781,102	76.6	68.7	121.1	106.9	121.002	1,039,466
Pitts.-Yngain.	44,348,000	2,873,084	30,405,531	76.4	68.7	101.3	91.2	424,004	4,190,720
Cleveland-Detroit	12,791,700	866,211	8,796,872	81.7	66.7	144.6	122.1	77.842	666,432
Chicago	27,371,700	1,960,160	20,746,404	84.0	75.8	125.3	113.2	123,871	1,177,207
Southern	6,632,340	421,817	5,176,426	71.6	74.7	120.8	126.2	4,183	87,501
Western	7,022,470	477,733	5,363,217	80.2	78.4	127.0	121.1	10,713	86,535
TOTAL	124,330,410	8,287,073	88,311,682	78.6	71.0	116.6	106.4	782,786	7,181,283

* Included under Total Steel.

** Based on average production of the three years 1947 through 1949 as 100.

x Revised.

ten 170-ton and the fourteen 200-ton furnaces of No. 2 shop has produced an advance in steelmaking capacity that is consistently more like 9.5 to 10 pct than it is 9 pct.

Inland Steel, discussing its gains, is careful to stick to its own facts—company operating men painstakingly point out that oxygen use must make its own economic bed before lying down at any particular mill; and oxygen cost, nearness of supply, and the mill's own particular hot metal requirements are factors that must be fitted into the equation.

Boost Oxygen Intake

For example in a slow year when hot metal requirements are down, is it more economic to discontinue oxygen and reduce overall metal output without reducing the number of furnaces in operation—or do you lay off furnaces, keep working the remainder on oxygen-boosted output?

Part of the answer may be in the fact that Inland has been boosting oxygen intake over the past 2 years. Whatever the economics, oxygen makes more steel.

Build New Ohio Plant

Construction is slated to begin early in April on a new basic refractories plant at Columbiana, O., 15 miles south of Youngstown. In it the Chemicals Div. of Kaiser Aluminum & Chemical Corp. will produce primarily basic brick of the following types: high magnesia periclase, periclase-chrome and chrome-periclase.

Completion date of the \$4 million job is expected late in 1955.

D. A. Rhoades, vice-president and general manager of the firm, states, "Besides substantially increasing our capacity to produce basic brick and ramming mixes, the new plant will enable the Chemicals Div. to give better service to steel producers and other industries throughout the East and Middle-West."

Steel:

Armco markets pure-aluminum coated sheet steel.

Armco Steel Corp. has developed a new type aluminum-coated steel for applications under general atmospheric conditions. The new product is being produced in sheet and coil form in widths up to 48-in. at Armco's Butler, Pa., plant.

Armco has been producing an aluminum-coated sheet since 1939 for temperature and heat-reflecting applications. The new product, under development for 18 months, is designed for exterior use.

Has Many Uses

Type I applications have included auto mufflers, combustion chambers, jet aircraft parts, jet engine test cells, and household appliances and water heaters. Type II has passed the test in prefabricated industrial, commercial, and farm buildings, industrial rolling doors, silo covers, water storage tanks, and roof deck.

The two types are produced under the same basic process by continuously applying molten aluminum to cold-rolled sheet steel. Principal difference is in the coating. Type I coating is an aluminum-silicon alloy; Type II coating is essentially pure aluminum.

Has Aluminum's Qualities

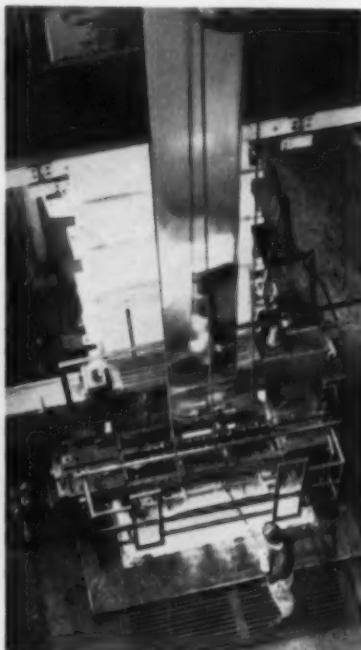
Armco claims its new product reacts the same as solid aluminum under atmospheric exposure; has the same high reflectivity of radiant heat as aluminum; that resistance to fire damage is better than that of aluminum or galvanized steel, withstanding temperatures up to 900°F without change and up to 1250°F without serious damage to the coating; that it is less susceptible than aluminum to buckling and tearing.

Coating adherence is said to be good under severe forming conditions.

The material can be embossed and spun but is not recommended for drawing. It can be welded by conventional methods but a satisfactory method of soldering is still under development.

Cost per square foot is said to be generally lower than that of alu-

minum of equal thickness. Armco also claims the cost will be less than that of galvanized steel plus one field coat of paint, since the aluminum-coated product will not require painting to extend service life.



MOLTEN aluminum is applied to cold-rolled sheet by a patented continuous pre-treatment and immersion process.



ERECTING aluminized Type 2 steel panels on a multiple-span industrial building. Photo: Armco.

ECONOMY: Ike Predicts Good Year

President sees high job and production levels . . . Cutbacks in Federal spending will be eased . . . Delay in corporate tax cut is asked . . . Private development will be encouraged—By N. R. Regeimbal.

• PRESIDENT EISENHOWER, continuing his "moderately progressive" philosophy, is sponsoring a Government program geared for long-term economic growth under which he predicts "high and satisfactory" employment and production in 1955.

In his annual economic message to Congress, the Chief Executive expressed cautious optimism, asserting that the nation has made the transition from contraction to recovery. "The vigor of the recent recovery," he said, "suggests that economic expansion will probably continue during the coming months."

It was on the basis of a projection of the recent general upswing of economic activity that the President based his proposed \$62.4 billion budget. But the Administration is warning that the Government will make sure, with its own medicine, that the economy continues to grow and remain in good health.

Ease Spending Cuts

First, the President said, the nation must keep a close watch on financial developments — an obvious reference to the stock market boom. Second, he reiterated that "social" legislation including Social Security, unemployment pay, and minimum wages, should be expanded.

To support his general predictions of better times, the President noted that the decline in Federal spending in 1955 will be less rapid than during the past 2 years, and predicted that "we are likely to experience some rebuilding of inventories."

As his formula for "partnership" between Government and business to create an expanding economy, the President proposed

the Government "create an atmosphere favorable to economic activity by encouraging private initiative, curbing monopolistic tendencies, avoiding encroachment of the private sector of the economy, and carrying out as much of its own work as is practicable through private enterprise." He credited "a variety of public and private actions" with staving off a more serious recession last year.

Some Tax Relief

Among Mr. Eisenhower's specific proposals are:

1. Postpone lowering the corporate income tax and excises, scheduled for Apr. 1;
2. Reduce the tax rate on corporate income from all foreign sources by 14 percentage points, to 30 per cent, and permit corporations with foreign branches to defer the tax on branch income until it is withdrawn from the country in which it was earned;

3. Allow a regulated investment company, holding the bulk of its assets in the form of tax-exempt securities, to pass through to its shareholders the tax exempt status of the income from such securities.

4. Strengthen the deterrent to violation of the antitrust laws by raising "substantially the maximum fine that may be imposed (reportedly to \$50,000);

5. Continue the program for helping small business obtain access to adequate financing, to a fair share of Government procurement contracts, and to competent counsel; and extend the Small Business Administration's lending authority;

6. Extend and liberalize the Reciprocal Trade Act, to increase foreign sales, and expand the area development program for aid to depressed communities.

In 10 Years— A \$500 Billion Economy

President Eisenhower, amateur artist, is painting a rosy picture of the nation's economy in 1965—an economy with \$500 billion a year production level, compared with the current level of about \$360 billion.

With wise management, Mr. Eisenhower forecasts, the present "surging drive of the economy" will carry the nation to new heights of prosperity.

This new economy, he predicts, will carry with it mammoth road building and modernization programs; whopping home construction

activity to keep up with the spiraling population; more employment, better jobs, higher wages, shorter work-weeks, higher productivity.

Among his suggestions for initial actions leading to the new economy are: Liberalized home mortgage terms; government aid in helping community planning; expansion of the interstate highway system; accelerated development of natural resources; increased state and local public works which should be coordinated with federal public works programs, and continued fiscal and monetary programs designed to stabilize the economy.

What's Behind the Uranium Boom

**Forget the over-cautious warnings — uranium boom is solid
... There's plenty of ore ... And there's a politically assured military
market for years to come ... Here's the set-up—By W. K. Gutman.**

♦ URANIUM is a political mineral and will remain so for most of the next decade. Its only important use at present is in military applications. Potential practical commercial applications which will develop during the next 10 years are substantial but much smaller than the continual furor about atomic energy leads one to believe.

Military demand is probably still rising. Actual projected military demand is highly classified but there are certain facts which lead to obvious conclusions if you think about them: Buildup of an atomic navy, which seems virtually certain; development of massive tactical artillery; development of intercontinental and counter-intercontinental missiles probably will require very large quantities of fissionable material.

Demand Will Be Steady

Since the main market for uranium will be military during most of the next 10 years, political considerations will obviously dominate the economics of this mineral. There are many facets to the politics of uranium, such as: (1) Tem-

perature of the cold war. (2) Politics of aiding the economies of our allies by buying uranium from them or their colonies. The U. S. may now be self-sustaining in uranium even with rising military demand, but it may be politically wise to continue off-shore purchases anyway. (3) Domestic political considerations—there are now 16 Senators who must pay some attention to the votes of uranium miners. The 12 Senators from the six main producing states (Colorado, Utah, New Mexico, Arizona, Wyoming and South Dakota) must pay a great deal of attention.

An administration which ceased to buy uranium would have to have extremely good reasons for doing so if this powerful bloc of Senators were to be satisfied. Political factors, therefore, indicate that there will for a good number of years be a steady demand for the uranium mined in the U. S. and probably elsewhere in the Western Alliance.

One practical aspect of uranium politics is that the cost of the present ore buying program is not

large in comparison to other expenditures. U. S. production in 1954 may have totaled 1.5 million tons of ore. At a typical \$35 a ton, price would be only a little over \$50 million. Value at the mill level would be between \$100 and \$150 million. Considering the small sums involved and the immense political importance of the mineral, it is inconceivable that there will be an important change of the ore buying policy before the 1956 elections.

Guarantee Has Loopholes

The Atomic Energy Commission has given a type of public guarantee to U. S. producers until 1962 and has made secret contracts with foreign producers. The public guarantee to U. S. miners is not nearly as broad and firm as most people believe—if AEC were ever to interpret it literally, the uranium industry would collapse, but there is no real danger of such a strict interpretation.

Some loopholes in the guarantee are that it applies only to two types of ore (roscolite and carnotite) delivered at only one buying station, Monticello, Utah, and covers only 1000 tons a year from any one mine. Ore from the famous Steen mine is not covered at all because it is not one of the ore types specified. Steen is believed to be collecting only partial payments at the moment—80 pct—on his ore, and AEC is believed to be fretting at the amount he is delivering. But when a new mill is put up at Moab, Utah, Steen's problems should clear up.

Because there will be a steady demand for uranium for a good many years, anyone who owns a good mine will make money. The uranium boom is much sounder than indicated by pious warnings

About This Story

Uranium is the most spectacular—and controversial—segment of the mining industry today. In a get-rich-quick business where "all you need is a Piper Cub and Geiger counter" it's no wonder the glamor has been rubbing off in all directions.

Romantic stories of bucket-seat prospectors flying up and down the canyons are fascinating to veteran and novice alike.

And some have struck it rich.

There's been nothing like it since the gold rush of '49.

Feeling our readers would like to know more of the significance of what's happening on the Colorado Plateau, THE IRON AGE asked Walter K. Gutman to find out what's behind the uranium boom.

Mr. Gutman is a metals economist for Goodbody & Co. He has made several trips to the Plateau, inspecting the mines, investigating the potential of different uranium mining areas.

from some ultra-conservatives. Many people are missing good profits, and even fortunes because they are being misled.

The uranium boom is characterized by two types of misinformation, each of which does the public harm. First and most obvious is promotional exaggeration or even falsification of facts plus overcapitalization of the new companies. Second is the excessive conservatism in high Wall Street quarters. Most serious minded investment firms have refrained from taking an active part in financing the new industry. So far not a single major "wire" house has underwritten a new uranium company. The honor and the profit of making the U. S. independent of any foreign source goes to the smaller underwriters who have raised the needed capital.

Ore Area Huge

Disregarding the obvious fact that many of the new uranium companies are likely to prove over-capitalized and that the booming stock market may have driven their stocks too high, the uranium boom is probably one of the soundest the country has ever had. Reason is that there is a great deal of the mineral to be found and vigorous prospecting has uncovered many profitable deposits. The boom is not phony—both the mines and the market are real.

The main uranium area is sometimes called the Colorado Plateau and sometimes the Four Corners area. The "corners" are made by the junction of four states—Colorado, Utah, Arizona and New Mexico. Total area in which some uranium has been found in the Four Corners is probably 400,000 to 600,000 square miles. Distances are the equivalent of New York to Cleveland and Cleveland to Memphis. Much of this is still totally unexplored for uranium.

To understand the uranium or any other mineral boom, we have to remember that the tools for exploring the earth's surface have been extremely crude until very recently. The surface of our planet has scarcely been scratched. The main area of the Corners where uranium mining is concentrated is an area of canyons and mesas.

The different rock formations have been exposed on the canyon walls for easy observation and the first mining was on the rims. Intensive drilling by the AEC and private contractors has uncovered large deposits lying hidden beyond the rims and deep under the overburden.

There are two main well-proved ore bearing formations, the Morrison and the Shinarump, but other formations are also yielding ore. Uranium is somewhat like oil in that certain formations have trapped the mineral in prehistoric times. A company owning untested property which is "on formation" has a good chance of finding ore. Not too much is really known about uranium geology even now and for this reason formations which have not been found to be ore bearers in the better prospected regions may prove ore bearers in newly prospected territory. No one really knows as yet where the uranium came from originally or how the deposits were formed.

What Mines Are Like

So far, few really large deposits have been found and no huge deposits in the 10 or 100 million ton class. Anaconda Copper and the Atchison, Topeka & Santa Fe RR probably have the only 1 to 2 mil-

lion ton deposits of commercial ore yet found in this country. These are in New Mexico.

Since there are literally hundreds of deposits of rich ore scattered in this vast region, the uranium boom has been characterized by the birth of hundreds of new companies. Fortunately for them, the ore lies fairly close to the surface. Capital requirements for equipment are small, labor costs per ton are low.

Most mines are entered by inclined shafts from the surface or simple tunnels into a cliff wall. Timbering is usually unnecessary, water problems are not severe. In fact, the main water problem is its scarcity. Lifting costs can be \$3 to \$5 a ton, overhead \$2 a ton, royalty \$4 to \$7 a ton. AEC pays an exploration allowance of 50¢ a ton which is one way to figure that cost. AEC also pays a \$3.50 a ton bonus on the first 10,000 tons of ore produced by a mine.

Veterans figure total costs in the range of \$15 to \$20 a ton with exceptional mines being lower or higher. Ore values run from \$15 to \$50 a ton delivered.

There is a pronounced tendency to low grade on actual delivery to the sampling stations in order to avoid sampling bias. In dealing with very expensive ores, sampling

WHERE URANIUM IS FOUND



EXPANSION

presents a real technical problem and the millers and the miners have politely grim views of each other's morals. Eventually deep drilling may uncover really large deposits, but there is no clear reason yet found why the ore concentration should be more substantial when the formation is deep down than when it is high on the mesa.

Vanadium a Factor

Most of the mines now existing or being opened up will be worked out by the time the present AEC "guarantee" expires in 1962. Unless the guarantee is extended, every effort will be made to mine out by the closing date and even without such effort no known deposit could support more than 8 years of intensive exploitation. To maintain the present lead of the U. S., constant exploration is essential and this probably means a higher price for uranium unless there is a radical political change.

Price problem is made more complex by the fact that the AEC also guarantees to buy the vanadium content of uranium bearing ores. The original producing area—the Uravan Mineral Belt—has carnotite ores which contain both uranium and vanadium. AEC would like to cease owning so much vanadium but to do this it will either have to raise the price of uranium or risk the drastic drop in production which would follow if it stopped buying vanadium since the vanadium content pays the overhead of many mines.

The shrewd investor will therefore try to pick mines where the uranium content is high, the vanadium low, because on a long term basis the price of uranium has a good chance of going up.

Management is probably more important in the boom country than ore. The region is far from heavily populated. Scarcity of good business management will probably force more mergers than lack of earnings or capital. Some operators, who have tended to stand around, waiting to pick up properties cheap when the new organiza-

tions run out of money, are likely to be disappointed since uranium ore is easy to mine and readily convertible into cash.

One of the interesting aspects is that the first companies in the business have not done a remarkable job of developing new areas. The Grants area was developed mainly by Anaconda after the AEC begged them to do so. The Gas Hills District in Wyoming has been exploited by moderate-sized organizations. The remote and very exciting Circle Cliffs area is being developed by small companies.

Power A Long Way Off

Fact seems to be that the pioneers got psychologically used to values of the pre-boom days, or to use another psychological term, their libido was satisfied by their early and very notable accomplishments. The emotional energy which was needed for wide prospecting came from newcomers both large and small.

As to commercial nuclear energy—it will take years to build enough reactors to provide a large market for uranium. Even if the engineering and economics were clearly determined, and this is not the case right now, it would take several years to build and put into operation a large new power plant. Thus to predict that commercial nuclear power will not be a big business before 1965 is not to be pessimistic—merely realistic.

One of the characteristics of the boom is that the less people know, the more definitely optimistic or pessimistic they are. But a great

deal of good material has been published on commercial nuclear power which can lead only to one conclusion—it is an important but not really a revolutionary development. Right now generating costs are still high and are not expected to undercut hydro costs.

Perhaps some entirely new understanding of the atom will come about which will produce really cheap power but at present the greatest potential for nuclear power is in regions where power has been really high cost. Commercial nuclear power will develop and will be important, but it will not provide a huge market for many years. Moreover, it should be remembered that the whole power plant of the U. S., which is much the greatest in the world, does not by itself present an enormous market to coal mines and oil companies now. Fuel consumption per unit of energy in a power plant is low and will be even lower with atomic energy. That is the main point—cheap power means low fuel consumption.

Atomic Fuel: Law changes asked to spur peacetime uses.

In another 45 years, atomic fuel may be running half the power generators installed annually in the U. S. Representative Sterling Cole, R. N. Y., who makes this prediction, says the big problem is to speed atomic development for peaceful purposes by private interests.

Formerly chairman of the Joint Committee on Atomic Energy, Mr. Cole said the committee plans a review of the Atomic Energy Act and will examine thoroughly the status of the nuclear energy industry. Mr. Cole has proposed a repeal of the compulsory licensing features of the Act. He insists they curb productive applications of atomic energy and foster a concentration of new ideas in large firms.

Mr. Cole says the danger of accidents in nuclear energy activities is exaggerated and suggests federal insurance might be desirable if more favorable rates cannot be secured for companies with nuclear reactors.



"I believe it translates as THINK!"

WIVES: What They Think About Husbands

Line Materials Co. conducts counseling sessions for employees' wives . . . Firm knows wives play important part in success or failure of their husbands . . . Wives tell what bothers them most about their mates.

♦ A HUSBAND comes home tense and tired from the plant, gives his wife a peck on the cheek, mumbles "hi" to the kids, pats the dog and flops on the sofa with the evening paper.

"What happened at work today, dear?" the wife asks over the din of the children. "Nothing much," he replies, already buried in the sports page.

This scene, with variations, is common to many homes. And some companies are becoming interested in the problem because they are aware of the important role a wife can play in her husband's success. Line Material Co., Milwaukee, is one of the firms that is trying to do something about it through a series of counseling sessions with its employees' wives.

What Interested Wives

The program developed as an outgrowth of a "human relations" series management consultant Dr. Louis Hackemann held for L-M supervisors. Idea behind the se-

ries was to help employees learn more about themselves and others. As it turned out, Dr. Hackemann found the workers' wives were just as interested in having similar counseling sessions for themselves.

So far Dr. Hackemann has given this program to 148 wives at nine L-M plants and the response has been extremely good.

Dr. Hackemann learned a number of revealing facts from questionnaires he passed out to wives at the meetings. Ranked in the order of interest, the projects discussed at the sessions were: origin of emotions; frustration; drives and motivations; feelings and emotions; healthy and unhealthy behavior; and heredity and environment, with the first three drawing 70 pct of total interest.

Asked to rate their husbands as individuals, the wives indicated the three things that concerned them most were: worrying, tension, inability to relax; takes work

What Wives Would Like to Talk Over with a Counselor

	No. Replies
How to understand and raise children	40
Personal problems and frustration	34
How to gain insight and self-understanding	24
How to help their husband	21
Self-improvement	19
Money and its handling	10
How to help others	9
Family relationships and problems	8
Behavior	6
Marital adjustment	5
What is expected of a wife?	5

Source: Line-Material questionnaire

too seriously; and health.

Their concern over their husbands as social beings was more generalized, with five major categories: unwillingness (or inability) to discuss things with wife; failure to participate in family activity; relations with wife—common interests and marital relationships; poor handling of children; and failure to show appreciation and give recognition to the wife.

Points which the wives most wanted to discuss with counselors included: children—the problem of understanding and raising them; personal problems and frustration; how to gain insight and self-understanding; how to help their husbands, and self-improvement.

Management Wives Worry More

From the counseling sessions Dr. Hackemann found that the group's frustrations fell into definite patterns. Those with children, he found, were more in-

What Bothers Wives About Husbands

As Individuals

	No. Replies
Worrying, tension, inability to relax	38
Takes work too seriously	17
Health	13
Emotions and emotion problems	9
Lack of understanding of others	8
Lack of understanding of self	7
Dominating and bossy in home	5
Takes job home	4
Works too long hours	4
Lacks hobbies and outside interest	4

Source: Line-Material Co. questionnaire

As Social Beings

	No. Replies
Manners and personal appearance	4
Unwillingness (or inability) to discuss things with wife	23
Failure to participate in family activity	20
Relations with wife—common interests and marital relationships	18
Poor handling of children	16
Failure to show appreciation and give recognition (to wife)	12
Avoidance of social contacts	9
Money—how it's handled	5

MANGANESE: Studies May Pay

Indicate progress in search for manganese recovery method for low-grade ore and slag . . . Payoff expected by late 1956 . . . List new research projects.

◆ PRIVATE CONTRACTORS are beginning to get results in their efforts to boost the metallurgical use potential of low-grade domestic manganese, a new government report states.

Opportunities for final success are sufficiently good, the Emergency Procurement Service says, to warrant continuation of government aid in this work for at least 18 more months. By late 1956, EPS suggests, industrial and private research may produce techniques which will considerably reduce the dependence of steel companies on foreign sources of manganese.

As a component of General Services Administration, EPS was directed during the Korean crisis to contract for studies leading to the upgrading of low-grade ores and slags bearing manganese. The agency now reports on a number

of projects in which federal funds have been invested.

Viewed as the most likely sources of usable manganese are openhearth slags, the Aroostook County, Me., ores, and the manganeseiferous low-grade iron ores of the Cuyuna Iron Range in Minnesota. Because these materials have widely different characteristics, no single upgrading process may work with all.

A combination of processes may be tried with some materials. EPS is considering the possibility of pretreating Aroostook ores by flotation prior to leaching, or before the lime clinker-magnetic separation (Sylvester) process. The Sylvester process might also be used with openhearth slags.

Getting EPS attention as possible secondary supply sources are government stockpiles of submetallurgical ores in three West-

ern states, plus ores at Artillery Peak, Ariz. and those in the Virginia-Tennessee-Georgia-Alabama region and the Arkansas region.

Informally proposed by U. S. Bureau of Mines as a method of upgrading stockpiled ores is direct reduction in the blast furnace.

Research projects newly reported on by EPS are these:

(1) Southwestern Engineering Co., flotation studies of ores from six states, performed in Los Angeles.

(2) Mangaslag, Inc., pyrometallurgical process involving ore reduction from slag; pilot plant at Pittston, Pa.

(3) Manganese Chemical Corp., process combining roasting and leaching of Cuyuna ores at River-ton, Minn.

(4) Nossen Laboratories, Inc., process involving a reducing roast and nitric acid solution, at Pater-son, N. J.

(5) Bruce Williams Laboratories, a roasting-leaching process for all manganese-bearing ores and slags, at Joplin, Mo.

(6) Dr. L. W. King, roasting and leaching with hydrochloric acid; pilot plant being built at Salem, O.

(7) Diamond Alkali Co., pyrochemical process for ores and slags; test runs to be made at Painesville, O.

Management *Continued*

clined toward frustration. Also, management wives' frustrations seemed to be multiplied by the extent of their husbands' responsibilities.

Wives in small plant communities experience a lesser degree of frustration. Dr. Hackemann attributes this to the centering of social and religious activities around the home in the smaller communities.

Dr. Hackemann says the husbands' lack of desire to share problems is due to the fact that they are afraid of gossip. "They forget," he says, "that they have many more opportunities to relieve their frustrations by talking to their fellow employees. All the women have is a telephone."

On the other hand, Dr. Hack-

emann points out that a wife can't relieve her husband's tension by meeting it with her own. He feels that a wife often forgets her husband has had enough of work when he gets home. What he wants from his wife is escape from his work.

Wife Needs Independence

A wife and husband should share things as much as possible, Dr. Hackemann believes. They should develop mutual interests. However, the wife should have independence in managing the household, the budget, and her personal problems.

It is this independence which keeps a wife constructively occupied while her husband works late, attends meetings or travels,

according to Dr. Hackemann. And outside activities can help her to develop an outgoing personality and poise. "Her impression on others is vital to her husband's progress."

Dr. Hackemann says the most important step in helping her husband get ahead is to show him tactfully how he appears to others. Then he can correct his own shortcomings and put the accent on his strong points.

"A woman has fulfilled a good part of her end of the marriage contract by loyalty to her husband and strong faith in his ability to succeed in his work," Dr. Hackemann concludes. "It follows that this will inspire the confidence in himself that is so necessary to success."

SMOG: Near Practical Remedy

Exhaust of Los Angeles' 2.5 million cars causes eye-watering problem . . . City's unique climate a big factor . . . Auto industry research developing successful preventive devices—By R. D. Raddant.

♦ LOS ANGELES has found an ally in the automobile industry in its battle against eye watering, crop damaging, and embarrassing smog.

It has now been established to almost everyone's satisfaction that the major cause of Los Angeles area smog is the 1016 tons of hydrocarbons emitted daily from the country's 2½ million cars, the greatest concentration of automobiles per capita in the nation.

With this obvious interest in the smog battle, the auto industry, acting through the Automobile Manufacturers Assn. and individual research projects, has taken up the battle to clear the air over Los Angeles.

Consider Special Carburetors

The solution may take the form of a universally accepted carburetor that not only oxidizes most hydrocarbons but adds to gas mileage. It might be a catalytic muffler or some other appliance that could be optional for Los Angeles motorists only. It's too early to predict a concrete solution other than to say that the auto industry has already made progress on solving the problem.

Residents of the area can take a little dubious pride in its smog problem. The very atmospheric and climatic conditions they have been writing home about for years are responsible for the smog conditions that are now so irritating and potentially dangerous.

Unique Climatic Problem

Los Angeles is one of only five areas in the world where such a problem could arise, and the other four are relatively uninhabited. This in itself prevents Los Angeles' problem from becoming a national issue, even though Los

Angeles smog experts warn ominously that it could happen elsewhere.

The Los Angeles area is bounded on three sides by an arc of mountains and on the west by the ocean. During the months of May through November, a mass of warm air settles over the area forming a layer of warm air over the cooler air at ground level. This condition, known as temperature inversion, holds the air pollutants captive. With low wind velocity, the pollutants hover over the city for days, acting to restrict visibility and creating irritating gases.

Sunshine Causes Trouble

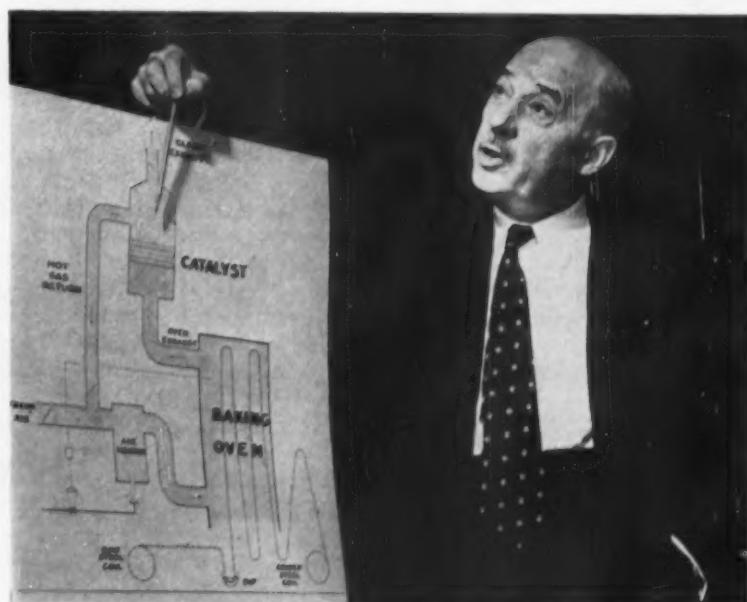
It was not immediately discovered that the famous Southern California sunshine acted to oxidize auto-produced hydrocarbons in the presence of nitrogen oxides

to produce the ozone concentrations now held responsible for the smog problem.

Like other cities with air pollution problems, Los Angeles acted first to reduce smoke and sulfur dioxide emissions. In spite of reductions, smog continued to increase. Next, control measures were invoked against refineries and the emission of hydrocarbons from this source was greatly reduced. But smog increased.

Auto Industry Helping

This led to the formation of the Southern California Air Pollution Foundation, an independent organization. Last week in Detroit at the Golden Anniversary meeting of the Society of Automotive Engineers, a battery of smog experts from the West Coast converged to tell the auto industry



EUGENE HOUDRY who successfully used catalysts in connection with exhaust from industrial plants has been working the problem of exhaust from autos.

RESEARCH

the Los Angeles story. In turn, automotive engineers related their own studies toward arresting or eliminating smog contributing features of the automobile.

F. G. Rounds and P. A. Bennett of the Research Laboratories Div. of General Motors pointed out that the modern car had built-in assets that could assist smog reduction. The new overhead-valve V-8 engines contribute fewer hydrocarbons and automatic transmissions also show improvements in cutting unburned hydrocarbons. They contend that "a substantial reduction in the average hydrocarbon content would be obtained by adjustment of the idle mixture ratio of all cars to the range resulting in best idle operation."

Burn Less Fuel

Carburetor modifications which would admit additional air and fuel to intake manifolds during deceleration or would shut off fuel during that period were proposed by J. T. Wentworth and W. A. Daniel, also of GM's Research Laboratories.

They pointed out that either change produces marked reductions in concentrations of unburned hydrocarbons in car exhausts, with the device which shuts off fuel during deceleration slightly more efficient. It would increase fuel economy in all-round driving by almost 3 pct.

These devices are still in the very experimental stage and many problems are still to be solved before such a device is ready for the market. However, this is the kind of apparatus that could become a "Los Angeles option."

Must Purify Exhausts

Dale H. Hutchison and Francis R. Holden, of Standard Research Institute at Stanford, said that automobile exhaust contributes one-third of the 3000 tons of organic contamination poured into Los Angeles atmosphere each day. "Automobiles must be equipped with devices which will curtail

the exhaust content of hydrocarbons by about 60 pct," they jointly concluded.

Gordon P. Larson, of the Air Pollution Control District of Los Angeles County, pointed out that the public has felt for years that the air could be used as a dumping ground of impurities for eternity.

"Los Angeles has proved this is not true," he said significantly. "All cities have their limit."

Tools:

Set uniform rental rates for government-owned tools.

Uniform rates for future rental of government-owned machine tools and metalworking equipment to private industry are set by a new Defense Dept. action.

These rates are uniform as regards the date on which the equipment was acquired by the Government. The fee for equipment bought in 1950 or later is to be 2 pct per month of the acquisition cost; for tools bought between 1942 and 1949, it will be 1½ pct per month; for older tools, 1 pct per month.

Based on Cost

General effect of the action is to raise the rates above the general basic rate of not less than 1 pct per month of the cost of the tool.

Applicable acquisition cost is the base price of the equipment, with standard accessories and attachments, charged when the

Government bought the item. If special attachments are included, a higher acquisition cost will apply.

Defense Dept. makes clear that rentals provided for in current contracts or leases are not affected. New schedules apply only to those arrangements taking effect after late January.

Basic for the rental is the total time that the equipment is available to the contracting firm, rather than the time in which the property actually is used. This requirement can be changed if found impracticable by the responsible officer.

Negotiated rates may be ordered in cases where entire Government-owned plants, or considerable real property plus equipment, will be affected.

Improve Car Spotting

New government-approved rules covering the placement of freight cars for loading and unloading purposes are designed to aid industrial shippers.

These rules, applying in states generally north of the Potomac and Ohio Rivers and east of the Mississippi, permit the railroads to offer improved car-spotting services at no additional charge.

Now given the approval of the Interstate Commerce Commission, the new rules state that the following delays will be allowed without any charges above regular line-haul rates:

(1) Temporary holding of cars on carrier or industry tracks for instruction from the shipper or receiver.

(2) Removal and replacement of partially-loaded and unloaded cars when incident to the placement or removal of other cars.

(3) Service of obtaining the weight of freight, irrespective of ownership of scales used, when the weights are to be entered in the carrier's bill.

(4) Classifying, sorting, and lining up of cars on industry tracks.

(5) Slowdowns and interruption resulting from operation of a rail common carrier on industry tracks.

(6) Operations incident to a service for which a separate charge is authorized by a published tariff.



"But it is the truth, Dear . . . three of us guys have to stay late and go through a lot of bar stock."

Missiles:

Chance Vought ships Navy Regulus in "cans."

While a guided missile has little difficulty traveling in air, getting around on the ground can be troublesome. Chance Vought Aircraft, Inc., for instance, had troubles shipping the Regulus from its Dallas factory to California test sites.

Trouble was that the wings stuck out too far from the sides of flat-bed trucks. This meant an escort was necessary and travel could only be accomplished during daylight. It was slow. It was expensive.

The firm's engineers struck upon the idea of a cylindrical container—a "can." Spencer-Safford Loadcraft, Inc., of Augusta, Kan., brought it off.

The reusable steel cylinder fits the Regulus with its wings folded and is rotated so the wings are nearly vertical. Now Regulus-carrying semi-trailers take up no more road space than ordinary trucks, eliminating extra time and expense of the old method.

Byproduct advantages are that the "can" is weatherproof and increases the protection of the missile while in transit or storage—which could be at advanced combat bases.

Ammo Short:

Senate Committee says West has ammunition shortage.

Free world countries would face a serious ammunition shortage in case of war and would have to depend on shipments from this country, a Senate Armed Services Subcommittee warns.

The subcommittee says hearings over the last 2 years have followed the buildup of U. S. ammunition stocks and production capacity, but that despite some improvements, foreign manufacturing capacities are still far short of what their armies would require in a war. It called for a "frank discussion" between the U. S. and potential allies.

"We spend billions of dollars annually to assist our allies to



CANNED guided missile ready to be hauled away by tractor.

recreate their economies and to strengthen the sinews of their military machines. It is entirely inconsistent that we overlook the key element in this entire defense effort, namely, adequate amounts of ammunition," the report says.

The investigators find little solace in reports that foreign countries have doubled their ammunition programs. "When you double, or redouble, a negligible quantity of production, the result is still negligible," the report comments.

Although the U. S. ammunition situation has vastly improved since the end of the Korean war, the report says, the Air Force is in a "weak position" with respect to suitable ammunition to keep pace with rapid developments in air firepower.

Tanker Awards Deferred

Maritime Administration has set Mar. 1 as the new date for award of contracts for private construction and long-term charter operation of 15 tankers.

Originally, the agency set Jan. 20 as the time for awarding con-

DEFENSE

tracts to or rejecting offers received from interested companies. However, some companies which submitted offers requested a postponement in order to meet certain requirements developed during negotiations, and Maritime Administration is complying with the request.

Contracts Reported

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Cup, case, brass for cartridge Ca. 30M2 2200000, \$1,344,000, Plume and Atwood Mfg. Co., Thomaston, Conn.

Cup, case, brass for cartridge cal. 30, 4450000, \$1,971,350, American Brass Co., Waterbury, Conn.

Shell, HE, M106 MPTS, 8" howitzer, 25500, \$1,018,470, U. S. Hoffman Machinery Corp., New York.

Casing burster T-27, 887000, \$2,006,039, Elsen Brothers, Inc., Hoboken, N. J.

OQ-19 target drones, \$5,198,558, Radioplane Co., Van Nuys, Calif.

Generators, acft-panel, control, 475,

\$421,962, Bendix Aviation Corp., Eatontown, N. J.

Strut assys, var., \$1,294,591, Axelson Mfg. Co., Div. Pressed Steel Car Co., Inc., Los Angeles, Calif.

Oxygen generators PR 444187, \$1,500,-

000, Air Products, Inc., Allentown, Pa.

Generator sets, sp pts, 525 ea, \$6,060,407,

Beech Aircraft Corp., Wichita, Kan., J. F.

Allen.

R3350-34 engines, \$8,103,240, Wright

Aero Div., Wood Ridge, N. J.

Countermeasure set electronic, 8 ea, \$3,-

543,244, Gilfillan Bros., Inc., Los Angeles, Calif.

INDUSTRY: Focuses on Work Scheduling

Maintenance men find work scheduling is becomingly increasingly difficult problem . . . Overly detailed planning seen as one of the causes . . . Don't try to schedule everything all at once—By K. W. Bennett.

MEETING for the sixth year this week at Chicago were the men who keep their home plants neat, sweet, and increasingly efficient. Their job: plant maintenance. Their aggregate value to industry: about \$10.25 billion. The 2500-plus maintenance men who attended the Plant Maintenance & Engineering conference represent a major industrial business, one that will spend an estimated \$5.4 billion in salaries, put another estimated \$4.86 billion into supplies and equipment this year.

This year the conferees were tackling a problem that gets more complicated all the time—work scheduling. How do you determine how many hours a particular maintenance program should take, and how many men? And how do you justify the time and wages consumed when total costs are chalked up at the year's end?

Too Many Details

Frank O. Pierson, Atlantic Refining Co., suggested over-detailed planning may be one of the problems. "We do not believe that Atlantic was any worse off than others using such tools (time standards for wage incentive use) for the control of maintenance costs. We feel that we may have been ahead of those not using work measurement. We planned one rebuilding job in advance . . . the job standard was 46 man days . . . It took the rate setter 10 days to work out the details of the methods. This 22 pct overhead is too much; it was good enough to show us this system costs too much."

Mr. Pierson's suggestion: avoidance of small standards, but setting up of large standards, which were augmented by Atlantic's own manuals of standard practice instructions. The system, starting with large values and standardized methods and working back, rather

than starting with piecemeal operations to work up to an evaluation for the individual job, seems valid.

Working with its own foremen, Atlantic's maintenance men drew up specifications for work methods for any type of field craft work normally performed in the refinery, the tools needed, and the materials.

Coupled with the standard practice instructions, are "engineered planning times," covering pieces of work as large as repairing a stair tread, or an entire hand rail.

But measuring small work units or large, work must be scheduled, and before it is scheduled it must be measured. W. F. Allison, Emerson Electric Manufacturing Co., tied the two directly, offering as one good recommendation of work scheduling that it forces some kind of work measurement, and suggested that work measurement begin with a study of individual jobs, the tools used, the method used, the materials used.

Branson Weaver, Bell & Howell Co., calls maintenance scheduling "one of our best tools to give us low downtime on production equipment and low maintenance cost."

Bell & Howell, employing 2200 workers, breaks maintenance into eight departments: a coordinator who also heads clerical functions and inspections; carpenter shop; machine maintenance shop; electrical shop; millwright shop (pipe fitters, machinery movers, welders, and laborers); tinsmith shop; engine and boiler room; janitor shop.

Most maintenance men agree scheduling is a good thing, but conference speakers admitted freely it occasionally has rusty gears. Said C. C. Carmine, Tide Water Associated Oil Co., "We started out 'great guns' to plan everybody and everything in maintenance. Very quickly we were in trouble and we took a good look at things, then stabilized the situation so that we were planning about 70 pct of our daily paid maintenance employees. In three-and-a-half years and after many studies, we have gradually increased the number being planned to 90 pct."

What They Agreed On

Despite considerable verbal sparing, maintenance men agreed:

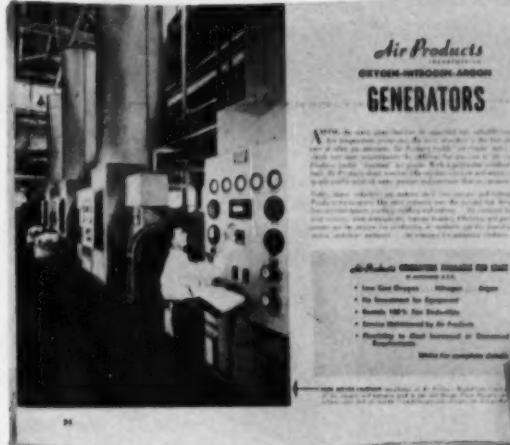
- The most important point in a properly scheduled maintenance program is a free flow of information from top to bottom of the plant work force and back up.
- That scheduling begin with some kind of work standardization and measurement. The agreement represents a considerable change. Time measurement in any form was a hotly contested issue in the recent past.
- That each job to be scheduled begin with study of the job by a specialist trained to do this type of analysis. This is another battleground of past years and is still open to contest.
- That over-scheduling is as dangerous as too little.



CUT OXYGEN COSTS

Make Your Own!

This free booklet tells you how

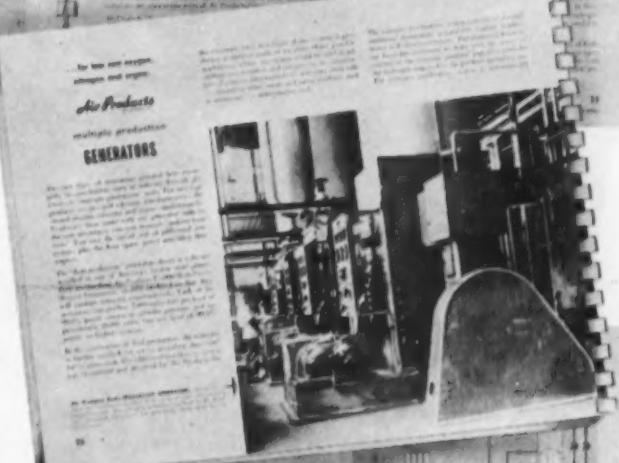
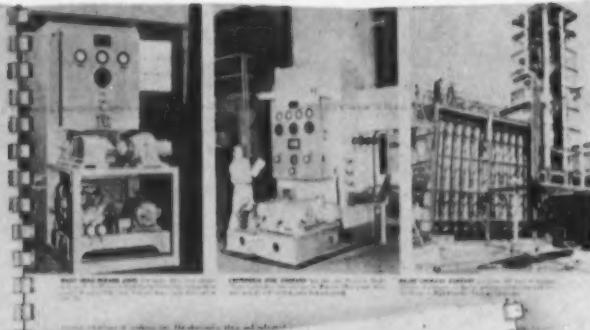


Air Products INCORPORATED OXYGEN-ARGON-ARGON GENERATORS

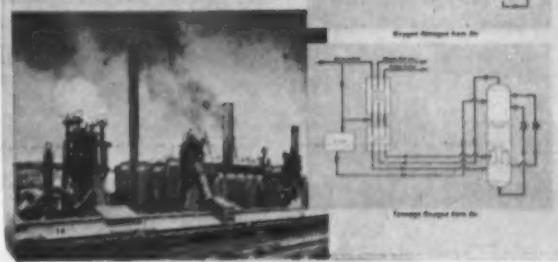
A low-temperature oxygen generator is a valuable addition to your plant. It can reduce your oxygen costs by up to 50% or more, depending on your particular needs. It can also reduce your capital investment in oxygen equipment. In addition, it can help you meet the increasing demand for oxygen in your industry.

- Low-Cost Oxygen
- Low-Cost Argon
- No Investment in Equipment
- Goods 100% For Reduction
- Simple Maintenance by Air Products
- Reliability is Our Standard in Commercial Equipment

Write for complete details



-Examples-



This profusely-illustrated booklet gives "why's" and "how's" of making your own oxygen. It shows typical installations . . . explains uses, types, capacities, purities . . . shows how oxygen generators were developed, how they're made, how they work. Schematic drawings show how temperatures down to -450°F are used to separate the pure oxygen, nitrogen and argon from air . . . recover valuable components from other gas mixtures, such as hydrogen and hydrocarbons from coke oven gas. Send the coupon for a free copy.

Air Products
INCORPORATED
High-Purity and Tonnage
OXYGEN GENERATORS

Air Products, Incorporated, Dept. I, Box 538, Allentown, Pa.

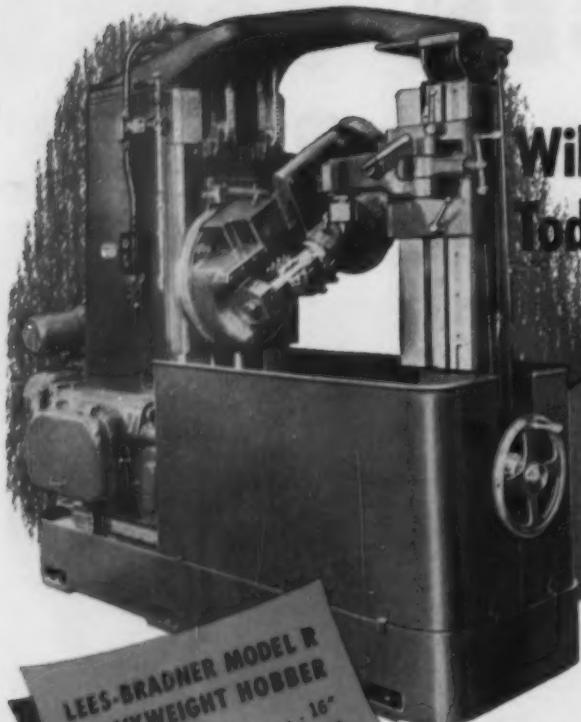
Please send me a copy of your new brochure, without obligation.

Name..... Title.....

Company.....

Street.....

City..... Zone..... State.....



LEES-BRADNER MODEL R
HEAVYWEIGHT HOBBER

Maximum Outside Dia. 16"
Travel 18"
Maximum Helix . . . RH 45° - LH 60°
Machine Weight . . . 13,000 lbs.
Motor Requirements . . . 15 to 25 HP

Will the Machines You Buy Today Fill Tomorrow's Needs?



How about that machine you're thinking of replacing today? Awhile back it looked pretty good, didn't it? Good enough to fill your needs when you bought it, anyway. But now it can't handle today's job and it must be replaced.

When you buy that new machine—*look ahead*. Don't invest in one that just barely meets today's needs. Think about that extra capacity you'll probably need tomorrow.

Lees-Bradner manufactures a full line of hobbing machines to meet different requirements. If a smaller capacity machine will do your job today—and tomorrow—fine, that's for you.

But if you suspect you'll need higher speeds, faster feeds and greater production capacity in the near future it's wise to gear your thinking and purchasing accordingly.



MODEL R HOBBER HT THREAD MILLER T-A ROTARY HOBBERS CRI-DAN THREADING MACHINES MODEL AG THREAD MILLER SH SPLINE HOBBER 15-S HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER

Steel Capacity

• Steelmaking capacity in U. S. increased 1.5 million tons during 1954, now stands at 125,828,310 net tons per year . . . Blast furnace capacity increased nearly 2 million tons to 83,971,100.

• Philadelphia district gains most new capacity . . . Chicago increases its first place margin . . . Pittsburgh only district to decline . . . Detroit scores 14 pct gain in electric furnace capacity.

• STEELMAKING capacity in the United States now stands at 125,828,310 net tons per year—an increase of 1,497,900 tons from the level of Jan. 1, 1954.

The increase during 1954 compares with a boost of approximately 6.8 million tons during 1953, and a rise of 8.9 million tons during 1952.

In the 9 postwar years steel companies in the U. S. have jumped their total capacity 34 million tons, or about 87 pct.

Basis of this new compilation of the industry's potential by IRON AGE districts is the detailed official capacity report just published by the American and Steel Institute.

By adding 421,000 net tons of capacity during 1954, Chicago strengthened its position as the No. 1 IRON AGE steelmaking district. The new capacity in the Chicago district amounted to over 28 pct of total capacity added in the U. S. Chicago district capacity now comprises 19.87 pct of the U. S. total.

For the second year in a row Pittsburgh was the only district

to show a decline. Pittsburgh capacity slipped 28,910 net tons, but the district is still firmly entrenched in second place with 18.27 pct of total U. S. capacity.

Philadelphia registered the greatest capacity increase—472,660 net tons, or nearly 32 pct of the total U. S. gain. With 13.4 pct of total U. S. capacity, Philadelphia is now firmly established ahead of Youngstown (11.08 pct of U. S. total) which it vaulted 2 years ago with the building of U. S. Steel's Fairless Works.

Detroit Boosts Electric

Third largest capacity gain among the districts was scored by Detroit, which added 232,220 net tons, or 15.5 pct of the total U. S. gain. Detroit ranks sixth among the districts in total steelmaking capacity.

Increase in Detroit capacity was due entirely to expansion of electric furnace and oxygen steelmaking at McLouth Steel Corp.

Nearly three-fourths of the capacity gain in Chicago dis-

trict was achieved by Inland Steel Corp. which increased the capacity rating of its Indiana Harbor Works by 300,000 tons per year. Most of this increase was credited to use of oxygen in openhearth furnaces.

Increase in Philadelphia district capacity was due almost entirely to addition of 450,000 tons capacity at Bethlehem Steel's Sparrows Point plant, now rated at 6.2 million tons.

The study again highlights the rising trend of electric furnace steelmaking capacity. During 1954 electric furnace capacity increased 3.43 pct, while openhearth capacity rose 1.04 pct, and bessemer capacity remained unchanged.

The biggest factor in the electric furnace capacity gain was the McLouth expansion which raised the electric furnace potential of the Detroit district by more than 14 pct—this on top of a 26 pct gain the previous year.

The industry's blast furnace capacity was increased 1,969,710 tons in 1954 to a total of 83,971,100.

IRON AGE DISTRICT CHANGES AT A GLANCE

IRON AGE	Pct of U. S. Capacity		Increase in Capacity		Pct of U. S. Increase	District Changes (Pct) By Type of Furnace		
	District	1955	1954	Net Tons	Pct	Open-hearth	Bessemer	
Chicago	19.87	19.78	421,000	1.71	28.11	1.44	0.00	5.38
Pittsburgh	18.27	18.51	-28,910	-0.13	-1.93	-0.14	0.00	0.01
Philadelphia	13.40	13.18	472,660	2.80	31.55	2.73	0.00	7.72
Youngstown	11.08	11.18	43,200	0.31	2.88	0.44	0.00	-0.09
West	7.06	7.14	1,080	0.01	0.07	0.10	0.00	-0.62
Detroit	5.39	5.27	232,220	3.55	15.50	0.00	0.00	14.34
Buffalo	5.21	5.19	100,000	1.55	6.68	1.57	0.00	0.00
Cleveland	4.96	5.02	0	0.00	0.00	0.00	0.00	0.00
South	4.15	4.07	166,000	3.28	11.08	3.45	0.00	0.00
Ohio River	3.90	3.92	29,680	0.61	1.98	1.20	0.00	-2.88
Wheeling	3.87	3.91	0	0.00	0.00	0.00	0.00	0.00
St. Louis	2.26	2.24	60,000	2.15	4.01	2.28	0.00	0.00
Northeast	0.58	0.59	870	0.13	0.06	0.00	0.00	0.59
Total	100.00	100.00	1,497,900	1.20	100.00	1.04	0.00	3.43

Official Steel Industry Capacities

Source: American Iron and Steel Institute

THE IRON AGE DISTRICTS STEEL CAPACITY

In Thousands of Net Tons—Source: American Iron and Steel Institute—Compilations: The Iron Age

District	1955		1954		1953		1952		1951	
	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total
Chicago	25,006	19.87	24,567	19.78	22,801	19.40	20,249	18.65	19,780	18.9
Pittsburgh	22,987	18.27	23,016	18.51	23,533	20.02	22,785	20.96	22,406	21.4
Philadelphia	16,859	13.40	16,386	13.18	14,834	12.62	13,489	12.42	12,958	12.4
Youngstown	13,939	11.08	13,896	11.18	13,664	11.62	13,490	12.42	13,157	12.6
Western	8,884	7.06	8,883	7.14	8,404	7.15	7,635	7.03	8,878	8.5
Detroit	6,783	5.39	6,551	5.27	5,806	4.94	5,130	4.72	4,770	4.5
Buffalo	6,552	5.21	6,482	5.19	6,192	5.27	5,460	5.03	5,200	4.9
Cleveland	6,241	4.96	6,241	5.02	6,197	5.27	5,355	4.93	4,832	4.6
Southern	5,226	4.15	5,060	4.07	4,683	3.98	4,136	3.81	3,985	3.8
South Ohio River	4,905	3.90	4,875	3.91	4,063	3.45	3,724	3.43	3,795	3.6
Wheeling	4,866	3.87	4,866	3.91	4,496	3.82	4,496	4.14	4,281	4.1
St. Louis	2,845	2.26	2,785	2.24	2,160	1.84	2,010	1.85	1,863	1.7
Northeast	733	0.58	733	0.59	724	0.62	648	0.60	615	0.6
Total	125,828	100.00	124,330	100.00	117,547	100.00	108,588	100.00	104,503	100.00

BLAST FURNACE CAPACITIES BY COMPANIES AND GEOGRAPHIC

Annual Capacity of Blast Furnaces as of January 1, 1955

	No. of ovens	Total annual capacity (in. t.)
Companies:		
Alan Wood Steel Company	2	454,000
Armco Steel Corporation	6	1,840,000
Bethlehem Steel Division	1	360,000
TOTAL	9	2,200,000
Barion Steel Corporation:		
Chester Blast Furnace, Inc.	1	200,000
Erie Company, Louis	1	136,000
Bethlehem Steel Company	33	(a) 12,600,000
Colorado Fuel and Iron Corporation	7	1,463,000
Cuyahoga Steel Company of America	3	895,000
Detroit Steel Company	3	747,000
Eastern Gas and Fuel Associates	1	191,000
Ford Motor Company	3	1,230,000
Globe Iron Company	1	100,000
Granite City Steel Co.	2	450,000
Inland Steel Company	8	2,638,930
Interlake Iron Corporation	6	1,555,000
International Harvester Company	3	731,000
Jackson Iron & Steel Company	1	95,000
Jones & Lamson Steel Corporation	13	4,651,000
Kaiser Steel Corporation	3	1,314,000
Levins Company, E. J.	2	113,000
Lone Star Steel Company	1	385,000
McLeath Steel Corporation	1	483,500
National Steel Corporation:		
Great Lakes Steel Corporation	4	1,720,000
Hann furnace Corporation	4	850,000
Weirton Steel Company	4	2,000,000
TOTAL	12	4,570,000
New Jersey Zinc Company:		
Pittsburgh Coke & Chemical Company	2	(e) 112,000
Pittsburgh Steel Company	5	836,500
Republic Steel Corporation	3	960,000
Sharon Steel Corporation	11	7,230,000
Shoreham Furnace Company	3	709,630
Tennessee Products & Chemical Corp.	1	445,438
Towanda Iron Division	1	217,748
United States Pipe & Foundry Co.	4	165,000
United States Steel Corporation:		
United States Steel Corp. (Central Operations)	53	(d) 19,107,000
American Steel & Wire Division	6	1,692,000
Columbia-Geneva Steel Division	8	1,804,000

(a) Includes 216,000 tons ferroalloys capacity.
(b) Pennsylvania only.
(c) Springfield only.
(d) Includes 392,000 tons ferroalloys capacity.

Capacity of Blast Furnaces — January 1, 1955 (Continued)

	No. of ovens	Total annual capacity (in. t.)
Companies (Continued):		
National Tube Division	9	3,255,100
Tennessee Coal & Iron Division	9	(e) 3,309,000
TOTAL	82	(f) 29,668,700
Wheeling Steel Corporation	6	1,800,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,440,000
GRAND TOTAL	361	(g) 83,971,100
Plant Location and Operating Company:		
Alabama (Southern District)		
Birmingham	2	402,000
Republic Steel Corporation	2	281,330
United States Pipe & Foundry Co.	2	281,330
East Tennessee:		
Knoxville	6	1,800,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,440,000
GRAND TOTAL	361	(g) 83,971,100
Plant Location and Operating Company:		
Alabama (Southern District)		
Birmingham	2	402,000
Republic Steel Corporation	2	281,330
United States Pipe & Foundry Co.	2	281,330
East Tennessee:		
Knoxville	6	1,800,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,440,000
GRAND TOTAL	361	(g) 83,971,100
California (Western District):		
Fountain	3	1,314,000
Kaiser Steel Corporation	3	1,314,000
Colorado (Western District):		
Pueblo	4	932,400
Colorado Fuel and Iron Corporation	4	932,400
Illinois (Chicago District):		
Chicago	2	587,000
Interlake Iron Corporation	2	450,000
Granite City	2	450,000
South Chicago	3	731,000
International Harvester Company	3	455,000
Republic Steel Corporation	1	455,000
United States Steel Corp. (Central Operations)	11	4,196,700
Youngstown Sheet and Tube Company	3	684,000
TOTAL	33	7,101,700

(e) Includes 39,000 tons ferroalloys capacity.
(f) Includes 361,000 tons ferroalloys capacity.
(g) Includes 801,000 tons ferroalloys capacity.

East
Verm
Geri
Unt
Op
Indi
Inla

Ash
Arm

Spar
Bett

Ever
East

Mid
Dow
Fay
Rive
Ore
Trans
McL

Dul
Am
Inte

Buff
Har
Rep
Lock
Eas
Nor
Ton
Tona
Col
Troy
Rep

STEEL CAPACITY BY COMPANIES AND TYPES

Annual Steel Capacity (Ingots and Steel for Castings) as of January 1, 1955

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (M. T.)
	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	
Basic:							
Open hearth—basic	890	109,371,670					109,371,670
Open hearth—and	35	839,990					839,990
Bessemer			60	33	6,787,000		6,787,000
Electric					216	10,807,150	10,807,150
Crucible					1	40	40
TOTAL	933	110,224,100	(b) 33	4,787,000	399	10,807,150	125,820,310
Companies:							
Alcoa Wood Steel Co.	8	621,000					621,000
Allied Ludlow Steel Corporation	5	340,000			31	634,300	861,300
American Compressed Steel Corp.					1	31,000	31,000
American Locomotive Co.	3	153,000					153,000
Armen Steel Corporation	35	2,110,000			9	406,000	3,116,000
Shefield Steel Division	14	1,424,000			3	360,000	1,784,000
TOTAL	39	4,114,000			11	765,000	4,950,000
Atlantic Steel Company	3	188,000			1	112,000	300,000
Bethelock & Wilson					4	229,610	329,610
Bethelock-Lima Manufacturing Corp.	5	169,930			(a) 1	40	169,930
Barium Steel Corporation							
Central Iron & Steel Co.	5	360,000			1	48,000	408,000
Industrial Forge & Steel, Inc.	3	48,000					48,000
Phoenix Iron & Steel Co.	6	432,000					432,000
TOTAL	13	840,000			1	48,000	888,000
Berkman Company, Louis							
Ohio River Steel Div.	4	136,000					136,000
Bethlehem Steel Corp.							
Bethlehem Steel Co.	125	17,700,000	3	336,000	4	158,000	18,300,000
Bethlehem Pacific Coast Steel Corp.	10	492,000			3	402,000	900,000
TOTAL	136	18,194,000	3	336,000	7	160,000	19,300,000
Borg-Warner Corporation							
Brown & Root Steel Corp.							
Byers Company, A. M.							
Cabot Shops, Inc.							
Canonsburg Works, Inc.							
Carpenter Steel Company							
Colorado Fuel & Iron							
Dillingham's Sons Corp., J. A.	87	8,330,000					8,330,000
TOTAL	90	235,000					335,000
TOTAL	16	1,471,500					3,471,500

Steel Capacity (Ingots and Steel for Castings) January 1, 1955 (Continued)

COMPANY	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (M. T.)
	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	No.	Annual capacity (M. T.)	
Companies (Continued):							
Columbia Tool Co.							3 6,000
Continental Steel Corp.	3	394,000					394,000
Copeland Steel Co.							7 618,300
Crucible Steel Company of America	9	971,000					971,000
Detroit Steel Corp.	15	1,290,000					1,290,000
Dresser Steel Co., Inc.							Henry
Eastern Statesman Steel Corp.							3 35,000
Edgewater Steel Corp.	3	99,000					99,000
Empire Steel Corporation	7	500,000					500,000
Erie Forge & Steel Corp.	5	214,000					214,000
Fink & Sons Co., A.							3 33,000
Foster-McKees Corp.							3 30,000
Ford Motor Company	10	1,511,000					1,511,000
Granite City Steel Co.	18	1,290,000					1,290,000
Green River Steel Corp.							3 100,000
Harrison Steel Corp.							3 100,000
Hesseltine Company	2	58,070					58,070
Houston Steel Corporation							1 5,000
Inland Steel Company	40	3,000,000					3,000,000
International Harvester Company	11	1,000,000					1,000,000
Isaacson Iron Works							3 102,000
Jeepers Steel Company							4 33,000
Jones & Laughlin Steel Corporation	17	5,563,000	3	381,000	1	1,500	6,166,500
Judyn Mfg. & Supply Co.							3 37,000
Judson Steel Corporation	3	78,500					78,500
Kentucky Steel Corporation	9	1,588,000					1,588,000
Kirkay Steel Company							3 325,000
Knoxville Iron Company							3 34,000
Laclede Steel Company	4	500,000					500,000
Lehigh Valley Steel Company							3 24,000
LeTourneau, Inc., R. O.							3 83,100
Lone Star Steel Co.	4	550,000					550,000
Lukens Steel Company	13	750,000					750,000
M. W. Kellogg Company							6 1,200,000
Merritt Chapman & Scott Corp.							
Milton Steel Prod. Div.							2 57,000
Newport Steel Corp.	7	375,000					375,000
TOTAL	7	375,000					4,600,000
Metz Machine Company	4	85,000					85,000
Midvale Company	4	146,100					146,100
National Forge & Ordnance Company							3 35,000
National Steel Corp.							
Great Lakes Steel Corp.	17	1,400,000	(b) 2				1,400,000
Worrell Steel Co.	13	2,400,000	(b) 2				2,400,000
TOTAL	30	6,800,000	(b) 4				6,800,000

Pet of Total

18.91

21.44

12.40

12.60

6.58

4.56

4.98

4.62

3.81

3.63

4.10

1.78

0.59

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

100.00

Official Steel Industry Capacities

American Iron and Steel Institute

IRON AGE DISTRICTS STEEL CAPACITY

In Thousands of Net Tons—Source: American Iron and Steel Institute—Compilations: The Iron Age

District	1955		1954		1953		1952		1951	
	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total	Net Tons	Pct of Total
Chicago	25,006	19.07	24,587	19.78	22,801	19.40	20,249	18.65	19,760	18.91
Pittsburgh	22,067	18.27	23,016	18.51	23,533	20.02	22,785	20.96	22,406	21.44
Philadelphia	16,059	13.40	16,386	13.18	14,834	12.62	13,400	12.42	12,058	12.40
Youngstown	13,930	11.08	13,896	11.18	13,864	11.62	13,490	12.42	13,167	12.80
Western	8,864	7.06	8,883	7.14	8,404	7.15	7,635	7.03	6,678	6.58
Detroit	8,783	6.58	6,551	5.27	6,806	6.94	5,130	4.72	4,770	4.56
Buffalo	6,552	5.21	6,452	5.19	6,102	5.27	5,400	5.03	5,200	4.98
Cleveland	6,241	4.98	6,241	5.02	6,197	5.27	5,355	4.93	4,632	4.62
Southern	5,226	4.15	5,060	4.07	4,683	3.98	4,136	3.81	3,985	3.81
Ohio River	4,905	3.90	4,875	3.92	4,053	3.45	3,724	3.43	3,795	3.53
Wheeling	4,866	3.87	4,866	3.91	4,496	3.82	4,496	4.14	4,281	4.10
St. Louis	2,845	2.26	2,785	2.24	2,160	1.84	2,010	1.85	1,063	1.78
Northeast	733	0.58	733	0.58	724	0.62	648	0.60	615	0.58
Total	125,828	100.00	124,330	100.00	117,547	100.00	108,568	100.00	104,503	100.00

STEEL CAPACITY BY COMPANIES AND DISTRICTS

Annual Steel Capacity (Ingots and Steel for Castings) as of January 1, 1955

Company	No.	Annual capacity (M. T.)	SINTER HEARTH	BESSEMER	ELECTRIC AND CRUCIBLE	Total annual capacity (M. T.)	
						No.	Annual capacity (M. T.)
Open hearths—Basic	89	109,374,670	.....	.....	.....	109,374,670	
Oxygen—Basic	89	859,000	.....	.....	.....	859,000	
Electric	5	63,330	4,787,000	.....	.....	4,787,000	
Crucible	1	40	1	1	1	40	
TOTAL	94	110,824,000 (M. T.)	4,787,000	339	10,007,110	115,828,110	
Companies							
Alcoa Steel Corp.	8	621,000	.....	.....	.....	621,000	
Allegheny-Alton Steel Corporation	5	340,000	.....	31	614,300	614,300	
American Compressed Steel Corp.	3	103,000	.....	1	31,000	31,000	
American Locomotive Co.	1	20,000	.....	.....	.....	20,000	
Armco Steel Corporation	35	2,410,000	9	466,000	3,316,000		
Electric Steel Division	14	1,434,000	3	300,000	1,734,000		
TOTAL	39	4,144,000	13	760,000	4,904,000		
Atlantic Steel Company	3	188,000	.....	1	312,000	312,000	
Baldwin-Lima-Hamilton Corp.	5	169,920	.....	(a) 1	40	169,920	
Barion Steel Corporation	5	340,000	.....	1	45,000	466,000	
Central Iron & Steel Co., Industrial Pipe & Steel, Inc.	2	48,000	.....	.....	.....	48,000	
Phoenix Iron & Steel Co.	6	432,000	.....	.....	.....	432,000	
TOTAL	13	842,000	.....	1	45,000	886,000	
Berkman Company, Los Angeles Branch Steel Division	4	110,000	.....	.....	.....	110,000	
Bethlehem Steel Corp.	130	17,700,000	3	338,000	6	18,000	18,338,000
Bethlehem Pacific	10	498,000	.....	.....	8	401,000	900,000
Coast Steel Corp.	10	498,000	.....	.....	8	401,000	900,000
TOTAL	136	18,204,000	3	338,000	7	560,000	19,160,000
Borg-Warner Corporation	.....	.....	.....	.....	6	164,000	164,000
Brown-Boveri Alloy Steel Corp.	.....	.....	.....	1	30,730	30,730	
Bryers Company, A. M.	.....	.....	.....	3	73,000	73,000	
Camden Wire Works, Inc.	.....	.....	.....	1	12,000	12,000	
Carpenter Steel Company	.....	.....	.....	3	18,000	18,000	
Colorado Fuel & Iron Corp.	97	2,234,500	.....	.....	.....	2,234,500	
Robbins' Sons Corp., J. A.	9	335,000	.....	.....	.....	335,000	
TOTAL	106	2,471,500	.....	.....	.....	2,471,500	

BLAST FURNACE CAPACITIES BY COMPANIES AND GEOGRAPHIC LOCATION

Capacity of Blast Furnaces as of January 1, 1955

No. of works	Total annual capacity (M. T.)	
2	554,800	
6	1,840,000	
1	260,000	
TOTAL	2,300,000	
Steel Corporation	1	300,000
Blast Furnace, Inc.	1	300,000
Company, Louis	1	136,800
Iron Steel Company	35	(a) 13,000,000
Fuel and Iron Corporation	7	1,461,000
Iron Company of America	3	995,000
Steel Corporation	2	1,167,700
Gas and Fuel Associates	1	191,100
Steel Company	3	1,320,300
Gas Company	1	100,000
City Steel Co.	1	90,000
Steel Company	8	3,636,950
Iron Corporation	6	1,555,000
International Harvester Company	1	231,000
Iron & Steel Company	1	95,000
Lehigh Steel Corporation	13	4,067,000
Steel Corporation	3	1,114,000
Company, E. J.	1	112,000
Steel Company	1	90,000
Steel Corporation	1	683,500
TOTAL	18	6,170,000
Steel Corporation	4	1,720,000
Furnace Corporation	4	860,000
Steel Company	4	3,000,000
TOTAL	12	4,580,000
Key Zinc Company	2	(c) 113,000
U.S. Coke & Chemical Company	2	836,500
Steel Corporation	22	7,000,000
Steel Corporation	3	709,630
Products Company	3	445,550
Products & Chemical Corp.	3	317,740
Steel Division	1	165,000
Steel Pipe & Foundry Co.	4	491,710
Steel Steel Corporation	6	10,107,400
Steel Steel Division	6	1,363,000
U.S. Génova Steel Division	5	1,304,200

Capacity of Blast Furnaces — January 1, 1955 (Continued)

No. of works	Total annual capacity (M. T.)	
Companies (Continued)		
National Tube Division	9	3,255,100
Tennessee Coal & Iron Division	9	(a) 3,209,000
TOTAL	82	(F) 29,068,700
Wheeling Steel Corporation	6	5,200,000
Woodward Iron Company	4	377,630
Youngstown Sheet & Tube Company	13	4,140,000
GRAND TOTAL	261	(g) 83,071,100
Plant Location and Operating Company:		
Kirkland (Northern District)		
Birmingham		
Republic Steel Corporation	8	402,000
United States Pipe & Foundry Co.	8	381,130
Easley		
Tennessee Coal & Iron Division	6	(e) 1,898,300
Fairfield		
Tennessee Coal & Iron Division	3	1,310,700
Elkton		
Republic Steel Corporation	1	525,000
East Birmingham		
North Birmingham	1	525,000
United States Pipe & Foundry Co.	1	316,400
Woodward		
Woodward Iron Company	4	773,330
TOTAL	21	(e) 5,000,340
California (Western District)		
Fontana		
Kaiser Steel Corporation	3	1,314,000
Exercito (Western District)		
Birmingham		
American Steel & Wire Division	8	402,000
Interlake Iron Corporation	1	146,000
TOTAL	9	637,000
Illinoian (Chicago District)		
Duluth		
American Steel & Wire Division	2	491,000
Interlake Iron Corporation	1	146,000
TOTAL	3	637,000
New York (Eastern District)		
Buffalo		
Horna Furnace Corporation	4	850,000
Republic Steel Corporation	3	618,000
Lackawanna		
Bethlehem Steel Company	7	3,036,000
North Tonawanda		
Towanda Iron Division	1	165,000
Towanda		
Colorado Fuel & Iron Corporation	3	390,000
Troy		
Republic Steel Corporation	1	163,000
TOTAL	17	5,372,000
(e) Includes 30,000 tons ferroalloys capacity.		
(f) Includes 361,000 tons ferroalloys capacity.		
(g) Includes 801,000 tons ferroalloys capacity.		

Capacity of Blast Furnaces — January 1, 1955 (Continued)

No. of works	Total annual capacity (M. T.)	
Ohio (Pittsburgh - Youngstown District)		
Campbell		
Youngstown Sheet and Tube Company	4	1,400,000
Canton		
Republic Steel Corporation	1	200,000
Hubbard		
Youngstown Sheet and Tube Company	1	200,000
Jackson		
Globe Iron Company	1	100,000
Jackson Iron & Steel Company		
Louisville		
Louisville Steel Corporation	1	100,000
Martine Ferry		
Louis Berkman Company	1	100,000
Massillon		
Republic Steel Corporation	1	100,000
Middletown		
Armoa Steel Corporation	1	100,000
New Miami		
Armoa Steel Corporation	2	100,000
Portsmouth		
Detroit Steel Corporation	2	100,000
Ridgewood		
Republic Steel Corporation	5	1,100,000
Scranton		
Bethlehem Steel Corporation	1	100,000
Shelby		
Pittsburgh Coke & Chemical Company	1	100,000
Warren		
Republic Steel Corporation	1	100,000
Youngstown		
Republic Steel Corporation	5	1,100,000
United States Steel Corp. (Central Operations)	6	3,900,000
Youngstown Sheet and Tube Company	2	1,000,000
SubTotal (Pitts. - Young. Dist.)	36	10,000,000
Ohio (Cleveland - Detroit District)		
Cleveland		
American Steel & Wire Division	2	100,000
Jones & Laughlin Steel Corporation	2	100,000
Republic Steel Corporation	6	2,000,000
Lorain		
National Tube Division	5	1,000,000
Toledo		
Interlake Iron Corporation	3	100,000
SubTotal (Clev. - Det. Dist.)	17	6,100,000
TOTAL—Ohio	53	17,100,000
Pennsylvania (Pittsburgh - Youngstown District)		
Alquippa		
Jones & Laughlin Steel Corporation	5	1,000,000
Braddock		
United States Steel Corp. (Central Operations)	7	1,000,000

IND TYPES

Steel Capacity (Ingots and Steel for Castings) January 1, 1955 (Continued)

COMPANIES	OPEN HEARTH	BOF/BESSEMER	ELECTRIC AND CRUCIBLE	Total capacity (M.T.)		
					No.	Annual capacity (M.T.)
COLUMBIA TUDOR STEEL CO.	3	6,000	6,000	12,000		
CONTINENTAL STEEL CORP.	5	394,000	7	618,300	1,012,300	
COOPERATIVE STEEL CORP.						
CROSS COUNTRY COMPANY OF AMERICA	9	972,000	17	379,400	1,351,400	
DETROIT STEEL CORP.	14	1,350,000		1,350,000		
DUNN & SONS, INC.						
EDGARSON STEEL CORP.	2	25,000	25,000	50,000		
EDGARSON STEEL CORP.	3	32,000	32,000	64,000		
ELKHORN IRON & STEEL CO.	2	100,000	100,000	200,000		
ERIC FERGUSON & SONS CORP.	3	134,000		134,000		
FISCH & SONS CO., A.						
FOURTH STAR HOLDING INC.	1	33,000	33,000	66,000		
GRANITE CITY STEEL CO.	10	1,531,000	2	214,000	1,755,000	
GREEN RIVER STEEL CORP.	16	1,700,000		1,700,000		
HARRISBURG STEEL CORP.	3	160,750	160,750	321,500		
HARRISON STEEL CORPORATION	2	36,470	36,470	72,940		
INLAND STEEL COMPANY	40	3,000,000		3,000,000		
INTERNATIONAL HARVESTER COMPANY						
JOHNSON IRON WORKS	11	1,000,000		1,000,000		
JONES & LAUGHLIN STEEL COMPANY						
JONES & LAUGHLIN STEEL COMPANY	37	5,382,000	3	311,000	5,693,000	
JORDAN MILLS & SUPPLY CO.						
JUDSON STEEL CORPORATION	3	76,500	37,500	76,500		
KAIER STEEL CORP.	9	1,538,000		1,538,000		
KAYNE STEEL & WIRE CO.	4	431,000		431,000		
KELLOGG STEEL COMPANY						
KNOXVILLE IRON COMPANY						
LACLADE STEEL COMPANY	4	380,000		380,000		
LAKERS STEEL COMPANY						
LA TERRAZZA IRON & CO.						
LAKERS STEEL COMPANY	6	390,000		390,000		
LAKERS STEEL COMPANY	12	750,000		750,000		
MCLEOD STEEL CORPORATION						
MERRILL CHAPMAN & SONS CORP.						
MILTON STEEL PROD. DIV.						
NEWPORT STEEL CORP.	7	375,200	2	67,000	442,200	
TOTAL		375,200		67,000	442,200	
MESTA MACHINE COMPANY	4	83,000		83,000		
MIDVALVE COMPANY	4	140,100		140,100		
NATIONAL FORGE & ORDNANCE COMPANY						
NATIONAL IRON CORP.						
OLYMPIA LAKERS STEEL CORP.	17	2,400,000	(b) 2	2,400,000		
WEIRTON STEEL CORP.	13	2,600,000	(b) 2	2,600,000		
TOTAL		5,000,000	(b) 4	5,000,000		

Steel Capacity (Ingots and Steel for Castings) January 1, 1955 (Continued)

COMPANIES	OPEN HEARTH	BOF/BESSEMER	ELECTRIC AND CRUCIBLE	Total capacity (M.T.)		
					No.	Annual capacity (M.T.)
NATIONAL SUPPLY CO.						
NEWPORT NEWS SHIPBUILDING & DRY DOCK CO.						
NORTHWESTERN STEEL ROLLING MILLS, INC.						
OMEGA STEEL MILLS						
PACIFIC STATES STEEL CORP.	3	181,770		181,770		
PITTSBURGH STEEL CO.	11	1,404,000		1,404,000		
POWER CO. INC., N. H.						
PUBLIC STEEL CORP.	78	4,321,000	2	645,000	4,966,000	
ROTARY ELECTRIC STEEL CO.						
SHARON STEEL CORP.	17	1,478,000		1,478,000		
SOUTHERN STEEL						
SWIFTER MILLS						
STANLEY WORKS	3	183,300		183,300		
TEAROFF STEEL CORP.						
TENNESSEE BOILER HEATING COMPANY						
UNION ELECTRIC STEEL CORP.						
UNITED STATES STEEL CORP.						
UNITED STATES STEEL CORP. (Central Operations)	177	39,664,000	(c) 8	1,384,000	41,048,000	
AMERICAN STEEL & WIRE DIV.						
COLUMBIA-GENEVA STEEL DIV.	38	1,275,000			1,275,000	
NATIONAL TUBE DIV.	19	1,490,000			1,490,000	
TENNESSEE COAL & IRON DIV.	15	2,700,000	6	1,110,000	3,810,000	
TOTAL	23	2,997,000	(b) 3		3,097,000	
UNIVERSAL CYCLOPS STEEL CORPORATION	260	36,126,000	17	3,394,000	39,520,000	
VANDUARD ALUMINUM STEEL CO.						
COLONIAL STEEL CO.						
TOTAL		6	47,000		47,000	
VULCAN CRUCIBLE STEEL CO.						
WADSWORTH WIRE CO.	4	93,000		93,000		
WEST VIRGINIA STEEL & MFG. CO.						
WHEELING STEEL CORP.	11	1,560,000	1	370,000	1,930,000	
WILKES BROS. INC.						
YOUNGSTOWN SHEET AND TUBE COMPANY	41	5,180,000	2	340,000	5,520,000	
GRAND TOTAL	925	110,724,100	(d) 33	4,787,000	115,511,100	

Capacity of Blast Furnaces — January 1, 1955 (Continued)

COMPANIES	No. of stacks	Total annual capacity (M.T.)		
			No.	Annual capacity (M.T.)
PENNSYLVANIA (Pittsburgh - Youngstown District) (Continued)				
CLAYTON				
UNITED STATES STEEL CORP. (Central Operations)	3	(a)	630,000	
DONORA				
AMERICAN STEEL & WIRE DIVISION	2		450,000	
DUQUESNE				
UNITED STATES STEEL CORP. (Central Operations)	6	(b)	1,313,100	
FREIGHT				
BIRMINGHAM STEEL CORPORATION	2		561,000	
MCKINSPORT				
NATIONAL TUBE DIVISION	4		1,380,300	
MIDLAND				
CRUCIBLE STEEL COMPANY OF AMERICA	3		895,000	
MONROEVILLE				
PITTSBURGH STEEL COMPANY	3		960,000	
NEVILLE ISLAND				
PITTSBURGH COKE & CHEMICAL COMPANY	2		654,000	
PITTSBURGH				
JONES & LAUGHLIN STEEL CORPORATION	6		1,927,000	
BLAW KILLEEN				
UNITED STATES STEEL CORP. (Central Operations)	6		9,330,000	
SHARPSVILLE				
SHERANO FURNACE COMPANY	2		445,500	
Sub-Total (Pitts. - Youngs. Dist.)	51		15,892,500	
PENNSYLVANIA (Eastern District)				
BETHLEHEM				
BETHLEHEM STEEL COMPANY	7		2,708,000	
BIRDSBORO				
COLORADO FUEL AND IRON CORPORATION	1		151,200	
CENTER				
CLAYTON BLAST FURNACE, INC.	1		200,000	
ERIE				
INTERSTATE IRON CORPORATION	1		271,000	
FAIRLESS HILLS				
UNITED STATES STEEL CORP. (Central Operations)	3		1,134,000	
JOHNTOWN				
BETHLEHEM STEEL COMPANY	7	(e)	1,708,000	
PAIMERTON				
NEW JERSEY Zinc COMPANY	2	(d)	113,000	
SHREVEPORT				
LAUREL AND COMPANY, E. J.	1	(e)	56,000	
STERTON				
BETHLEHEM STEEL COMPANY	3		876,000	
BUCKLAND				
ALAN WOOD STEEL COMPANY	2		454,000	
Sub-Total (Eastern Dist.)	27		7,671,000	
TOTAL—Pennsylvania	78	(f)	33,563,650	
(a) Includes 85,200 tons ferroalloys capacity.				
(b) Includes 327,000 tons ferroalloys capacity.				
(c) Includes 216,000 tons ferroalloys capacity.				
(d) Spiegaleisen only.				
(e) Ferromanganese only.				
(f) Includes 706,800 tons ferroalloys capacity.				

Capacity of Blast Furnaces — January 1, 1955 (Continued)

COMPANIES	No. of stacks	Total annual capacity (M.T.)		
			No.	Annual capacity (M.T.)
TEXAS (Southern District)				
LYNN-WRIGLEY				
LYNN PRODUCTS & CHEMICAL CORP.	1		36,100	
TEXAS PRODUCTS & CHEMICAL CORP.	3		181,440	
TOTAL	3		217,740	
TEXAS (Southern District)				
Houston				
SHEFFIELD STEEL DIVISION	1		360,000	
Lone Star				
LONE STAR STEEL COMPANY	1		385,000	
TOTAL	2		745,000	
UTAH (Western District)				
GEO. G. CO.				
COLUMBIA-GENEVA STEEL DIVISION	3		1,321,100	
IRONTON				
COLUMBIA-GENEVA STEEL DIVISION	3		482,700	
TOTAL	5		1,804,300	
VERMONT (Southern District)				
LYNCHBURG				
LAVINIA AND COMPANY, E. J.	1	(a)	56,000	
West Virginia (Pittsburgh - Youngstown District)				
BENWOOD				
WHEELING STEEL CORPORATION	1		346,000	
WEIRTON				
WEIRTON STEEL COMPANY	4		9,000,000	
TOTAL	5		9,346,000	
DISTRIBUTION BY DISTRICTS:				
EASTERN	54	(b)	17,456,100	
PITTSBURGH-YOUNGSTOWN	95	(c)	29,931,670	
CLEVELAND-DETROIT	25		9,692,600	
CHICAGO	48		16,431,050	
SOUTHERN	37	(d)	6,419,000	
WESTERN	12		4,840,600	
TOTAL	381	(e)	83,971,100	

(a) Ferromanganese only.
(b) Includes 384,000 tons ferroalloys capacity.
(c) Includes 322,000 tons ferroalloys capacity.
(d) Includes 65,000 tons ferroalloys capacity.
(e) Includes 601,000 tons ferroalloys capacity.

COKE CAPACITY

Annual Coke Capacity as of January 1, 1955

COMPANIES	SINTERED		OTHER		Total capacity (M.T.)
	No. of ovens	Annual capacity (M.T.)	No. of ovens	Annual capacity (M.T.)	
Alan Wood Steel Company	151	600,000	580,000		
ARMCO STEEL CORPORATION	180	980,000	990,000		
Sheffield Steel Division	61	318,000	318,000		
TOTAL	348	1,308,000	1,308,000		
Bethlehem Steel Company	2,108	11,400,000	11,400,000		
Crucible Steel Company of America	113	831,000	831,000		
Detroit Steel Corporation	155	550,000	550,000		
Eastern Gas and Fuel Associates					

Ingot Capacity by Districts

DISTRICT-COMPANY	Rated Annual Capacity—Net Tons				
	1955	1954	1953	1952	1951
CHICAGO					
American Locomotive Co.	70,000	70,000	70,000	70,000	70,000
American Steel & Wire Div.	973,000	973,000	918,000	918,000	918,000
Borg Warner Corp.					
Chicago	100,000	100,000			
New Castle, Ind.	64,000	64,000	64,000	30,000	28,000
Total	164,000	164,000	94,000	30,000	28,000
Columbia Tool Steel Co.	6,000	6,000	6,000	6,000	6,000
Continental Steel Corp.	364,000	364,000	364,000	364,000	363,700
A. Finkle & Sons	33,000	33,000	33,000		
Inland Steel Co.	5,000,000	4,700,000	4,500,000	3,700,000	3,700,000
International Harvester Co.	1,000,000	1,000,000	1,000,000	900,000	900,000
Jeslyn Mfg. & Supply Co.	37,000	37,000	37,000	37,000	37,000
Northwestern Steel & Wire Co.	825,000	825,000	825,000	321,000	321,000
Republic Steel Corp.	1,232,000	1,232,000	1,232,000	1,132,000	1,100,000
United States Steel Co.					
Gary	7,194,000	7,117,000	6,993,000	6,264,400	6,025,700
South Works	5,470,000	5,470,000	5,016,000	4,891,000	4,675,000
Total	12,664,000	12,587,000	11,608,000	11,156,400	10,790,700
Youngstown Sheet & Tube Co.	2,676,000	2,666,000	2,103,500	1,525,000	1,525,000
TOTAL Chicago District	25,007,700	24,549,700	22,806,800	20,249,500	19,756,810

PITTSBURGH

Allegheny Ludlum Steel Corp.	746,700	746,700	746,700	746,700	786,500
American Locomotive Co.	103,000	103,000	103,000	103,000	103,000
American Steel & Wire Div.	1,015,000	1,015,000	900,000	900,000	900,000
Armsco Steel Corp.	496,000	496,000	474,000	474,000	474,000
Bethcock & Wilcox Tube Co.	229,400	229,400	229,400	133,400	64,000
Bethlehem Steel Co.	2,330,000	2,200,000	2,100,000	2,100,000	2,026,000
Brockburn Alloy Steel Corp.	20,730	20,730	20,730	20,730	20,720
Byers, A. M. Co.	75,000	75,000	75,000	75,000	75,000
Colonial Steel Co.	30,000	30,000	28,000	7,000	7,000
Crusible Steel Co.	1,194,000	1,194,000	1,194,000	1,137,000	1,085,000
Edgewater Steel Co.	69,000	69,000	69,000	69,000	146,470
Firth Sterling, Inc.	20,040	20,040	20,040	20,040	20,040
Happennall Steel Co.	55,800	55,800	55,500	55,500	42,000
Jesse Steel Co.	33,400	33,400	33,400	33,400	41,900
Jones & Laughlin Steel Corp.					
Allegipolis	1,764,000	1,764,000	1,764,000	1,764,000	1,764,000
Pittsburgh	3,087,500	3,087,500	3,337,500	2,880,000	2,137,500
Total	4,881,500	4,881,500	4,101,000	4,344,000	3,901,500
Lakota Steel Co.	24,000	24,000	24,000	28,200	12,000
Mesta Machine Co.	105,000	105,000	105,000	105,000	105,000
National Tube Div.	1,446,000	1,446,000	1,224,000	1,224,000	1,164,000
Pittsburgh Steel Co.	1,404,000	1,404,000	1,320,000	1,072,000	1,072,000
Union Electric Steel Corp.	26,700	27,700	26,700	36,700	26,700
Universal-Cyclops Steel Co.	70,100	70,100	70,100	70,100	84,100
United States Steel Co.					
Clairton	1,084,000	1,084,000	947,000	900,000	870,000
Duquesne	1,462,000	1,462,000	1,735,000	2,080,000	1,842,000
Edgar Thompson	2,179,000	2,179,000	2,060,000	2,060,400	2,060,400
Harmont	3,766,000	3,575,000	4,496,000	4,304,000	4,066,000
Johnstown	25,000	25,000	25,000	24,400	24,400
Vandergrift	375,000	275,000	550,000	485,000	
Total	8,496,000	8,575,000	9,476,000	9,900,000	10,283,000
Vanadium-Alloys Steel Co.	12,000	11,910	11,910	11,910	11,910
Velma Crucible Co.	8,000	8,000	8,000	8,000	8,000
TOTAL Pittsburgh District	22,988,870	23,815,790	23,532,500	22,795,300	22,405,850

Official Steel Ingot Capacities By IRON AGE

DISTRICT-COMPANY	Rated Annual Capacity—Net Tons				
	1955	1954	1953	1952	1951
PHILADELPHIA					
Alan Wood Steel Co.	625,000	625,000	625,000	625,000	550,000
Armsco Steel Corp.	102,000	102,000	102,000	102,000	102,000
(Rustless Iron & Steel Div.)					
Baldwin-Lima-Hamilton Corp.	188,000	188,000	188,000	188,000	148,000
Bethlehem Steel Co.					
Bethlehem	3,214,000	3,214,000	3,148,000	3,125,000	3,080,000
Sparrows Point	8,200,000	5,750,000	5,400,000	5,400,000	5,160,000
Steelton	1,354,000	1,354,000	1,312,000	1,312,000	1,032,000
Total	10,770,000	10,320,000	9,860,000	9,840,000	9,272,000
Carpenter Steel Co.	85,800	85,800	85,800	85,800	81,360
Central Iron & Steel Co.	408,000	408,000	408,000	408,000	408,000
Claymont Steel Corp. (C.F.&I.)	498,000	494,570	494,570	488,000	488,000
Henry Dillen & Sons, Inc.	25,000	25,000	25,000	25,000	25,000
Eastern Stainless Steel Co.	32,000	32,000	32,000	14,400	12,000
Harrisburg Steel Corp.	100,750	100,750	100,750	100,750	100,750
Lukens Steel Co.	750,000	750,000	675,000	675,000	675,000
Midvale Co.	347,100	353,370	324,000	274,600	417,370
Million Steel Products Div. (Merritt-Chapman-Bell)	87,000	43,000	83,700	83,700	50,700
Newport News Shipbuilding & Drydock Co.	12,000	12,000	12,000	12,000	12,000
Phoenix Iron & Steel Co.	432,000	432,000	432,000	432,000	431,400
J. A. Roebling's Sons Co. (O.F.&I.)	235,000	235,000	236,000	204,870	204,870
United States Steel Co.	2,200,000	2,200,000	1,200,000		
TOTAL Philadelphia District	18,880,110	16,388,450	14,833,730	13,489,130	12,957,840
WESTERN					
Bethlehem-Pacific Coast Steel Co.					
Los Angeles	402,000	402,000	402,000	402,000	384,000
San Francisco	252,000	252,000	252,000	252,000	240,000
Seattle	248,000	248,000	248,000	248,000	218,000
Total	900,000	900,000	900,000	900,000	840,000
Cabot Shops, Inc.	12,000	550,000	550,000	550,000	
Cameron Iron Works					
Colorado Fuel & Iron Corp.	1,485,000	1,485,000	1,485,000	1,485,000	1,320,000
Columbia-Geneva Steel Div.					
Geneva	1,879,000	1,879,000	1,875,000	1,800,000	
Pittsburg	381,000	381,000	387,000	384,700	
Torrance	220,000	224,000	214,000	213,700	
Total	2,490,000	2,494,000	2,296,000	2,178,400	
General Services Adm.					72,300
Hester Steel Corp.	12,000	16,920	16,920	16,920	
Isaacson Iron Works	102,000	102,000	102,000	102,000	
Judean Steel Co.	78,500	78,500	78,500	78,500	
Kaiser Steel Corp.	1,536,000	1,536,000	1,536,000	1,536,000	
R. G. LeTourneau, Inc.	63,100	63,100	63,100	63,100	
Lone Star Steel Co.	550,000	550,000	550,000	550,000	
National Supply Co.	80,200	5	80,200	80,200	63,000
Northwest Steel Rolling Mills	42,000	42,000	42,000	42,000	32,400
Oregon Steel Mills	120,000	110,000	110,000	110,000	110,000
Pacific States Steel Corp.	181,770	181,770	298,000	298,000	
Seidelhuber Steel Rolling Mill Co.					60,000
Sheffield Steel Corp. (Armsco)					49,300
Sods Springs	54,000	54,000	54,000	54,000	
Houston	1,050,000	1,050,000	1,050,000	1,050,000	
Total	1,104,000	1,104,000	1,104,000	1,104,000	
Southwest Steel Rolling Mills	45,000	45,000	45,000	45,000	
Texas Steel Corp.	36,000	36,000	36,000	36,000	22,320
TOTAL Western District	8,864,370	8,883,280	8,403,840	8,403,840	7,835,14
DETROIT					
Allegheny Ludlum Steel Corp.	2,000	3,000	3,000	3,000	3,000
Ford Motor Co.	1,754,000	1,754,000	1,648,200	1,521,200	
Great Lakes Steel Corp.	3,400,000	3,400,000	3,150,000	2,800,000	
McLouth Steel Corp.	1,200,000	867,700	879,700	581,100	
Rotary Electric Steel Corp.	425,000	425,000	425,000	425,000	
TOTAL Detroit District	8,783,000	8,850,700	8,805,900	8,730,300	
BUFFALO					
Allaheny Ludlum Steel Co.					
Dunkirk	33,000	33,000	33,000	33,000	
Tonawanda	4,500	4,500	4,500	4,500	
Total	37,500	37,500	37,500	37,500	
Bethlehem Steel Corp.					
Erie Forge & Steel Co.	5,100,000	5,000,000	4,740,000	4,020,000	
National Forge & Ordnance Co.	234,000	234,000	234,000	234,000	
Republic Steel Corp.	25,000	25,000	25,000	25,000	
Simonds Saw & Steel Co.	882,000	882,000	882,000	882,000	
Colorado Fuel & Iron Corp.	21,000	21,000	21,000	21,000	
TOTAL Buffalo District	8,882,100	8,482,100	8,792,100	8,460,000	
CLEVELAND					
Jones & Laughlin Steel Corp.	1,306,000	1,305,000	1,305,000	1,305,000	1,185,000
National Tube Div.	2,384,000	2,384,000	2,384,000	2,384,000	2,300,000
Republic Steel Corp.	2,672,000	2,672,000	2,672,000	2,672,000	1,900,000
TOTAL Cleveland District	8,241,000	8,241,000	8,197,000	8,197,000	8,300,000

*Idle capacity previously reported with Republic at Canton.

IRON AGE Districts

Source:
American Iron and Steel Institute

Capacity—Net Tons

1952 1951

DISTRICT—COMPANY

Rated Annual Capacity—Net Tons

1955 1954 1953 1952 1951

SOUTHERN

Atlantic Steel Co.	306,000	306,000	306,000	168,000	186,000
Connors Steel Co.	67,500	67,500	67,500	60,000	60,000
Kilby Steel Co.	34,020	34,020	34,020	34,020	34,020
Knoxville Iron Co.	38,000	38,000	38,000	38,000	38,000
Republic Steel Co.	708,000	708,000	708,000	708,000	745,000
Tennessee Coal Iron Div.					
Ensley	1,770,000	1,745,000	1,625,000	1,625,000	1,868,000
Fairfield	2,227,000	2,096,000	1,830,000	1,802,000	1,882,000
Total	3,997,000	3,831,000	3,455,000	3,027,000	3,920,000
TOTAL Southern District	5,225,520	5,059,520	4,683,520	4,136,020	3,885,020

SOUTH OHIO RIVER

American Compressed Steel Co.	21,600	.....	.....	.....	.....
Armenia Steel Corp.					
Ashland	900,000	870,000	860,000	860,000	900,000
Middletown	1,715,000	1,697,000	1,548,000	1,505,000	1,840,000
Total	2,615,000	2,567,000	2,408,000	2,365,000	2,440,000
Detroit Steel Co.	1,390,000	1,295,000	860,000	860,000	850,000
Green River Steel Co.	190,000	241,920	190,000	.....	.....
Newport Steel Corp.	708,500	701,500	708,500	708,500	704,700
West Virginia Steel & Mfg. Co.	72,000	68,000	78,940	.....	.....
TOTAL South Ohio District	4,805,100	4,875,420	4,053,340	3,723,500	3,784,700

WHEELING

Ohio River Steel Div.	136,000	136,000	136,000	136,000	121,200
National Steel Corp.					
Winton Steel Co.	2,800,000	2,800,000	2,500,000	2,500,000	2,320,000
Wheeling Steel Corp.					
Benwood			420,000	420,000	420,000
Steubenville	7,130,000	7,130,000	1,440,000	1,440,000	1,440,000
Total			1,860,000	1,860,000	1,860,000
TOTAL Wheeling District	4,866,000	4,866,000	4,496,000	4,496,000	4,281,200

ST. LOUIS

Granite City Steel Co.	1,290,000	1,290,000	720,000	720,000	720,000
Keystone Steel & Wire Co.	425,000	425,000	400,000	400,000	325,000
Laclede Steel Co.	500,000	440,000	410,000	410,000	397,500
Shelfield Steel Div. (Armco)	830,000	830,000	830,000	480,000	420,000
TOTAL St. Louis District	2,845,000	2,785,000	2,160,000	2,010,000	1,882,000

NORTHEAST

Allegheny Ludlum Steel Co.	77,000	77,000	77,000	30,000	28,000
American Steel & Wire Div.	287,000	287,000	275,000	275,000	250,000
Crucible Steel Co. of America					
Harrison	7,000	7,000	7,100	2,300	2,100
Syracuse	58,000	58,000	58,000	58,000	54,200
Total	67,400	67,400	66,700	61,900	58,440
Stanley Works	188,200	188,200	188,200	188,200	188,200
Wabash Wire Co.	93,000	93,000	93,000	93,000	93,000
Wickwire Brothers, Inc.	20,000	19,830	.....	.....	.....
TOTAL Northeast District	733,400	732,510	699,980	648,240	614,720

Steel Capacity

♦ Steelmaking capacity in U. S. increased 1.5 million tons during 1954, now stands at 125,828,310 net tons per year . . . Blast furnace capacity increased nearly 2 million tons to 83,971,100.

♦ Philadelphia district gains most new capacity . . . Chicago increases its first place margin . . . Pittsburgh only district to decline . . . Detroit scores 14 pct gain in electric furnace capacity.

♦ STEELMAKING capacity in the United States now stands at 125,828,310 net tons per year—an increase of 1,497,900 tons from the level of Jan. 1, 1954.

The increase during 1954 compares with a boost of approximately 6.8 million tons during 1953, and a rise of 8.9 million tons during 1952.

In the 9 postwar years steel companies in the U. S. have jumped their total capacity 34 million tons, or about 37 pct.

Basis of this new compilation of the industry's potential by IRON AGE districts is the detailed official capacity report just published by the American and Steel Institute.

By adding 421,000 net tons of capacity during 1954, Chicago strengthened its position as the No. 1 IRON AGE steelmaking district. The new capacity in the Chicago district amounted to over 28 pct of total capacity added in the U. S. Chicago district capacity now comprises 19.87 pct of the U. S. total.

For the second year in a row Pittsburgh was the only district

to show a decline. Pittsburgh capacity slipped 28,910 net tons, but the district is still firmly entrenched in second place with 18.27 pct of total U. S. capacity.

Philadelphia registered the greatest capacity increase—472,660 net tons, or nearly 32 pct of the total U. S. gain. With 13.4 pct of total U. S. capacity, Philadelphia is now firmly established ahead of Youngstown (11.08 pct of U. S. total) which it vaulted 2 years ago with the building of U. S. Steel's Fairless Works.

Detroit Boosts Electric

Third largest capacity gain among the districts was scored by Detroit, which added 232,220 net tons, or 15.5 pct of the total U. S. gain. Detroit ranks sixth among the districts in total steelmaking capacity.

Increase in Detroit capacity was due entirely to expansion of electric furnace and oxygen steelmaking at McLouth Steel Corp.

Nearly three-fourths of the capacity gain in Chicago dis-

trict was achieved by Inland Steel Corp. which increased its capacity rating of its Indiana Harbor Works by 300,000 tons per year. Most of this increase was credited to use of oxygen in openhearth furnaces.

Increase in Philadelphia district capacity was due almost entirely to addition of 450,000 tons capacity at Bethlehem Steel's Sparrows Point plant now rated at 6.2 million tons.

The study again highlights the rising trend of electric furnace steelmaking capacity. During 1954 electric furnace capacity increased 8.48 pct, while openhearth capacity rose 1 pct, and bessemer capacity remained unchanged.

The biggest factor in electric furnace capacity growth was the McLouth expansion which raised the electric furnace potential of the Detroit district by more than 14 pct this on top of a 26 pct gain previous year.

The industry's blast furnace capacity was increased 1,970 tons in 1954 to a total 83,971,100.

IRON AGE DISTRICT CHANGES AT A GLANCE

IRON AGE	Per cent of U. S. Capacity		Increase in Capacity		Per cent of U. S. Increase	District Changes (Per cent) By Type of Furnace		
	District	1955	1954	Net Tons	Pct	Open-hearth	Bessemer	Electric
Chicago	19.87	19.78	421,000	1,71	28.11	1.44	0.00	—
Pittsburgh	18.27	18.51	—28,910	-0.13	-1.93	-0.14	0.00	—
Philadelphia	13.40	13.18	472,660	2.80	31.55	2.73	0.00	—
Youngstown	11.08	11.18	43,200	0.31	2.88	0.44	0.00	—
West	7.06	7.14	1,080	0.01	0.07	0.10	—	—
Detroit	5.39	5.27	232,220	3.55	15.50	0.00	—	—
Buffalo	5.21	5.19	100,000	1.55	6.68	1.57	—	—
Cleveland	4.96	5.02	0	0.00	0.00	0.00	0.00	0.00
South	4.15	4.07	186,000	3.28	11.06	3.45	—	—
South Ohio River	3.90	3.92	29,600	0.61	1.98	1.20	—	—
Wheeling	3.87	3.91	0	0.00	0.00	0.00	0.00	0.00
St. Louis	2.26	2.24	60,000	2.15	4.01	2.28	—	—
Northeast	0.58	0.59	970	0.13	0.06	0.00	—	—
Total	100.00	100.00	1,497,900	1.20	100.00	1.04	0.00	—

Official Steel Ingot Capacities By IRON AGE District

Capacity by Districts

COMPANY	Rated Annual Capacity—Net Tons					DISTRICT—COMPANY	Rated Annual Capacity—Net Tons					DISTRICT—COMPANY	Rated Annual Capacity—Net Tons					DISTRICT—	
	1955	1954	1953	1952	1951		1955	1954	1953	1952	1951		1955	1954	1953	1952	1951		
PHILADELPHIA																			
Allegheny Co.	75,000	75,000	75,000	75,000	75,000	Alan Wood Steel Co.	625,000	625,000	625,000	625,000	650,000	Bethlehem Pacific Coast Steel Co.	402,000	402,000	402,000	384,000	324,000	Atlantic States	
& Wire Div.	975,000	975,000	915,000	915,000	915,000	Armeo Steel Corp.	102,000	102,000	102,000	102,000	102,000	Los Angeles	282,000	282,000	282,000	260,000	240,000	Connors Steel	
sp.	100,000	100,000	.....	.....	.....	Baldwin-Lima-Hamilton Corp.	160,000	160,000	160,000	160,000	140,000	San Francisco	246,000	246,000	246,000	216,000	216,000	Kilby Steel
ntl.	64,000	64,000	64,000	30,000	28,350	Bethlehem Steel Co. ....	.....	.....	.....	.....	.....	Seattle	900,000	900,000	900,000	840,000	760,000	Knoxville Iron
ess Co.	164,000	164,000	64,000	30,000	28,350	Bethlehem	3,214,000	3,214,000	3,148,000	3,128,000	3,080,000	.....	.....	.....	.....	.....	Republic Steel	
Corp.	6,000	6,000	6,000	6,000	6,000	Sparrows Point	6,200,000	6,750,000	6,400,000	6,400,000	6,160,000	.....	.....	.....	.....	.....	Tennessee Gas	
s.	294,000	294,000	294,000	294,000	293,790	Stearns	1,356,000	1,356,000	1,312,000	1,312,000	1,032,000	.....	.....	.....	.....	.....	Ensley	
.....	33,000	33,000	33,000	.....	.....	Total	10,770,000	10,320,000	9,860,000	9,840,000	9,272,000	Cabot Shops, Inc.	12,000	55,000	.....	.....	.....	Fairfield
rvander Co.	5,000,000	4,700,000	4,800,000	3,750,000	3,750,000	Carpenter Steel Co.	65,000	65,000	65,000	65,000	61,360	General Services Adm.	1,870,000	1,870,000	1,675,000	1,600,000	1,440,000	Total, Sou	
Supply Co.	1,000,000	1,000,000	1,000,000	900,000	900,000	Central Iron & Steel Co.	408,000	408,000	408,000	408,000	408,000	Pittsburg	391,000	391,000	397,000	364,700	364,700	American G	
Steel & Wire Co.	87,000	87,000	87,000	37,500	37,500	Clyment Steel Corp. (C.F.A.I.)	400,500	494,570	494,570	488,000	468,000	Terrance	220,000	224,000	214,000	213,700	213,700	Armors Stee	
Corp.	825,000	828,000	825,000	321,000	321,000	Henry Dillast & Sons, Inc.	25,000	25,000	25,000	25,000	25,000	Total	2,490,000	2,494,000	2,286,000	2,178,400	2,018,400	Ashland	
Gas Co.	1,232,000	1,232,000	1,232,000	1,182,000	1,100,000	Eastern Stainless Steel Co.	32,093	32,000	32,000	14,400	12,000	Judson Steel Co.	78,500	78,500	78,500	78,500	78,500	Middleton	
....	7,100,000	7,117,000	8,063,000	8,284,400	8,025,700	Harrisburg Steel Corp.	100,700	100,750	100,750	100,750	100,750	Kaiser Steel Corp.	1,536,000	1,536,000	1,536,000	1,536,000	1,536,000	Total, Stee	
....	5,470,000	5,470,000	5,016,000	4,981,000	4,475,000	Lukens Steel Co.	780,000	780,000	675,000	675,000	675,000	R. G. LeTourneau, Inc.	83,100	83,100	138,800	.....	.....	Detrot, Stee
....	12,000,000	12,000,000	11,000,000	11,186,400	10,700,700	Midvale Co.	347,100	353,370	324,950	274,650	417,370	Lone Star Steel Co.	580,000	580,000	.....	.....	.....	Green River
....	2,670,000	2,688,000	2,103,000	1,828,000	1,828,000	Milton Steel Products Div.	67,000	43,000	63,700	63,700	60,700	National Supply Co.	50,200	80,200	80,200	83,000	50,400	Newport Stee	
....	25,000,000	24,588,700	22,800,000	20,246,800	18,796,810	(Merritt-Chapman-Scott) ....	.....	.....	.....	.....	.....	Northwest Steel Rolling Mills.	42,000	42,000	42,000	32,400	32,400	West Virgin
....	.....	.....	.....	.....	.....	Newport News Shipbuilding & Drydock Co.	12,000	12,000	12,000	12,000	12,000	Oregon Steel Mills.	120,000	110,000	110,000	110,000	110,000	TOTAL, Stee
....	.....	.....	.....	.....	.....	Phoenix Iron & Steel Co.	432,000	432,000	432,000	432,000	431,430	Pacific States Steel Corp.	181,770	181,770	296,000	232,000	231,300	Steel Rolling Mill Co.
....	.....	.....	.....	.....	.....	J. A. Roebling's Sons Co. (C.F.A.I.)	235,000	235,000	236,000	204,870	204,870	Seidelbauer Steel Rolling Mill Co. ....	.....	.....	60,000	49,300	.....	Sheffield Steel Corp. (Armeo)
....	.....	.....	.....	.....	.....	United States Steel Co.	2,200,000	2,200,000	1,200,000	.....	.....	Sheriff Steel Corp.	54,000	54,000	54,000	54,000	54,000	Sands Spring.
....	.....	.....	.....	.....	.....	Total Philadelphia District.	16,880,110	16,386,450	14,833,720	13,409,130	12,957,840	Houston.	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	Hoover.
....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,104,000	1,104,000	1,104,000	1,104,000	1,104,000	Westmoreland
....	.....	.....	.....	.....	.....	Southwest Steel Rolling Mills.	45,000	45,000	45,000	45,000	45,000	.....	45,000	45,000	38,000	38,000	38,000	St. Louis
....	.....	.....	.....	.....	.....	Texas Steel Corp.	30,000	30,000	22,320	22,320	22,320	.....	.....	.....	.....	.....	Green River	
....	.....	.....	.....	.....	.....	Total Western District.	8,884,370	8,883,290	8,403,640	7,635,140	8,872,540	.....	.....	.....	.....	.....	Newport Stee	
VALLEY (Youngstown)																			
....	.....	.....	.....	.....	.....	Copperweld Steel Co.	618,300	618,300	618,300	618,300	554,400	Allegheny Ludlum Steel Corp.	3,000	3,000	3,000	3,000	3,000	Ohio River
....	Damascus Tube Co.	1,800	1,800	1,800	1,800	1,800	Ford Motor Co.	1,755,000	1,755,000	1,646,200	1,621,200	1,471,940	National Stee
....	.....	.....	.....	.....	.....	Empire Steel Co.	500,000	455,000	455,000	408,300	380,320	Great Lakes Steel Corp.	3,400,000	3,400,000	3,150,000	2,600,000	2,450,000	Weirton Stee
....	.....	.....	.....	.....	.....	Industrial Forge & Steel, Inc.	48,000	46,600	46,600	48,600	48,600	McLouth Steel Corp.	1,200,000	867,780	879,700	581,100	420,000	Staunton Stee
....	.....	.....	.....	.....	.....	Reconstruction Finance Corp. ....	.....	.....	.....	.....	.....	Rotary Electric Steel Corp.	425,000	425,000	425,000	425,000	425,000	Total, Stee
....	Republic Steel Corp.	1,125,000	1,125,000	1,125,000	1,125,000	975,000	Total, Stee	WHEELING
....	.....	.....	.....	.....	.....	Canter.	1,125,000	1,125,000	1,125,000	1,125,000	975,000	Bethlehem Steel Corp.	5,100,000	5,000,000	4,740,000	4,025,000	3,920,000	Wheeling Stee
....	.....	.....	.....	.....	.....	Massillon.	620,000	620,000	620,000	620,000	610,000	.....	37,500	37,500	37,500	37,500	37,500	Benwood Stee
....	.....	.....	.....	.....	.....	Warren.	900,000	900,000	900,000	900,000	900,000	.....	.....	.....	.....	.....	Staunton Stee	
....	.....	.....	.....	.....	.....	Youngstown.	2,142,000	2,142,000	2,142,000	2,142,000	2,130,000	.....	.....	.....	.....	.....	Total, Stee	
....	.....	.....	.....	.....	.....	Total.	4,787,000	4,787,000	4,787,000	4,787,000	4,615,000	.....	.....	.....	.....	.....	DETROIT	
....	.....	.....	.....	.....	.....	Sharon Steel Co. ....	.....	.....	.....	.....	.....	Allegheny Ludlum Steel Corp.	3,000	3,000	3,000	3,000	3,000	DETROIT
....	.....	.....	.....	.....	.....	Farrell.	1,000,000	1,000,000	1,000,000	1,000,000	981,400	Ford Motor Co.	1,755,000	1,755,000	1,646,200	1,621,200	1,471,940	DETROIT
....	.....	.....	.....	.....	.....	Lowellville.	580,000	580,000	580,000	580,000	460,000	Great Lakes Steel Corp.	3,400,000	3,400,000	3,150,000	2,600,000	2,450,000	DETROIT
....	.....	.....	.....	.....	.....	Total.	1,850,000	1,850,000	1,850,000	1,850,000	1,441,400	McLouth Steel Corp.	1,200,000	867,780	879,700	581,100	420,000	DETROIT
....	.....	.....	.....	.....	.....	Timken Roller Bearing Co.	648,000	648,000	625,200	547,200	547,200	National Forge & Ordnance Co.	25,000	25,000	25,000	25,000	25,000	DETROIT
....	United States Steel Co.	2,943,000	2,943,000	2,734,000	2,684,000	2,684,000	Republic Steel Corp.	862,000	862,000	862,000	879,000	879,000	DETROIT
....	.....	.....	.....	.....	.....	Youngstown.	2,943,000	2,943,000	2,734,000	2,684,000	2,684,000	Simonds Saw & Steel Co.	21,000	21,000	21,000	21,000	21,000	DETROIT
....	.....	.....	.....	.....	.....	Youngstown Sheet & Tube Co.	1,178,000	1,182,000	1,182,000	1,182,000	1,182,000	Colorado Fuel & Iron Corp.	282,000	282,000	282,000	246,000	246,000	DETROIT
....	.....	.....	.....	.....	.....	Brier Hill.	1,064,000	947,000	900,000	870,000	870,000	Total, Stee	8,852,100	8,452,100	8,192,100	8,460,100	8,198,100	DETROIT
....	.....	.....	.....	.....	.....	Campbell.	1,462,000	1,735,000	2,080,000	1,942,000	1,942,000	.....	.....	.....	.....	.....	DETROIT	
....	.....	.....	.....	.....	.....	Total.	3,786,000	3,870,000	4,406,000	4,386,000	4,386,000	.....	.....	.....	.....	.....	DETROIT	
....	.....	.....	.....	.....	.....	Total Valley District.	13,938,860	13,695,760	13,863,000	13,490,260	13,186,720	.....	.....	.....	.....	.....	DETROIT	
....	.....	.....	.....	.....	.....	*idle capacity previously reported with Republic at Canton.	.....	.....									

Steel Capacity

DISTRICT-COMPANY

Rated Annual Capacity—Net Tons

1955 1954 1953 1952 1951

SOUTHERN

U.S. Steel Co.	300,000	300,000	300,000	188,000	188,000
Alcoa Steel Co.	67,500	67,500	67,500	60,000	60,000
Bethel Steel Co.	34,020	34,020	34,020	34,020	34,020
Youngstown Sheet & Tube Co.	38,000	38,000	38,000	38,000	38,000
Public Steel Co.	789,000	789,000	789,000	789,000	746,000
Allegheny Coal Iron Div.					
Youngstown	1,770,000	1,745,000	1,625,000	1,625,000	1,360,000
Fairfield	2,227,000	2,086,000	1,830,000	1,402,000	1,352,000
Total	3,997,000	3,831,000	3,455,000	3,027,000	2,928,000
TOTAL Southern District	5,225,520	5,000,520	4,633,520	4,136,020	3,905,020

SOUTH OHIO RIVER

American Compressed Steel Co.	21,800	.....	.....	.....	.....
U.S. Steel Corp.	.....	.....	.....	.....	.....
Cleveland	900,000	870,000	880,000	880,000	900,000
Middletown	1,715,000	1,607,000	1,548,000	1,505,000	1,540,000
Total	37,500	2,587,000	2,468,000	2,385,000	2,440,000
Detroit Steel Co.	1,290,000	1,290,000	860,000	850,000	830,000
Cleveland River Steel Co.	198,000	241,920	198,000	.....	.....
Youngstown Sheet & Tube Co.	708,500	708,500	708,500	708,500	704,700
West Virginia Steel & Mfg. Co.	72,000	68,000	78,040	.....	.....
TOTAL South Ohio District	4,905,100	4,875,420	4,083,340	3,723,500	3,794,700

WHEELING

Ohio River Steel Div.	136,000	136,000	136,000	136,000	121,200
U.S. Steel Corp.	2,800,000	2,800,000	2,500,000	2,500,000	2,390,000
Warren Steel Co.	.....	.....	.....	.....	.....
Youngstown Sheet & Tube Co.	426,000	420,000	420,000	420,000	420,000
Total	2,130,000	2,130,000	1,440,000	1,440,000	1,440,000
TOTAL Wheeling District	4,886,000	4,886,000	4,466,000	4,466,000	4,231,200

ST. LOUIS

U.S. Steel Co.	1,290,000	1,290,000	720,000	720,000	720,000
Youngstown Steel & Wire Co.	425,000	425,000	400,000	400,000	325,000
Allegheny Steel Co.	800,000	440,000	410,000	410,000	397,540
McLouth Steel Div. (Armco)	630,000	630,000	630,000	480,000	420,000
TOTAL St. Louis District	2,845,000	2,785,000	2,166,000	2,010,000	1,982,940

NORTHEAST

Allegheny Ludlum Steel Co.	77,000	77,000	77,000	38,000	25,000
American Steel & Wire Div.	257,000	257,000	275,000	275,000	256,000
Allegheny Steel Co. of America	.....	.....	.....	.....	.....
Harrisburg	7,000	7,000	7,100	2,380	2,180
Syracuse	58,000	59,000	58,000	59,000	58,280
Total	87,400	87,400	88,700	81,300	58,440
Panley Works	188,200	188,200	188,200	188,200	188,200
Ashland Wire Co.	93,000	93,000	93,000	93,000	93,000
Edwards Brothers, Inc.	20,000	19,000	.....	.....	.....
TOTAL Northeast District	733,400	732,510	689,800	646,240	614,720

♦ Steelmaking capacity in U. S. increased 1.5 million tons during 1954, now stands at 125,828,310 net tons per year . . . Blast furnace capacity increased nearly 2 million tons to 83,971,100.

♦ Philadelphia district gains most new capacity . . . Chicago increases its first place margin . . . Pittsburgh only district to decline . . . Detroit scores 14 pct gain in electric furnace capacity.

♦ STEELMAKING capacity in the United States now stands at 125,828,310 net tons per year—an increase of 1,497,900 tons from the level of Jan. 1, 1954.

The increase during 1954 compares with a boost of approximately 6.8 million tons during 1953, and a rise of 8.9 million tons during 1952.

In the 9 postwar years steel companies in the U. S. have jumped their total capacity 34 million tons, or about 37 pct. Basis of this new compilation of the industry's potential by IRON AGE districts is the detailed official capacity report just published by the American and Steel Institute.

By adding 421,000 net tons of capacity during 1954, Chicago strengthened its position as the No. 1 IRON AGE steelmaking district. The new capacity in the Chicago district amounted to over 28 pct of total capacity added in the U. S. Chicago district capacity now comprises 19.87 pct of the U. S. total.

For the second year in a row Pittsburgh was the only district

to show a decline. Pittsburgh capacity slipped 28,910 net tons, but the district is still firmly entrenched in second place with 18.27 pct of total U. S. capacity.

Philadelphia registered the greatest capacity increase—472,660 net tons, or nearly 32 pct of the total U. S. gain. With 13.4 pct of total U. S. capacity, Philadelphia is now firmly established ahead of Youngstown (11.08 pct of U. S. total) which it vaulted 2 years ago with the building of U. S. Steel's Fairless Works.

Detroit Boosts Electric

Third largest capacity gain among the districts was scored by Detroit, which added 232,220 net tons, or 15.5 pct of the total U. S. gain. Detroit ranks sixth among the districts in total steelmaking capacity.

Increase in Detroit capacity was due entirely to expansion of electric furnace and oxygen steelmaking at McLouth Steel Corp.

Nearly three-fourths of the capacity gain in Chicago dis-

trict was achieved by Inland Steel Corp. which increased the capacity rating of its Indiana Harbor Works by 300,000 tons per year. Most of this increase was credited to use of oxygen in openhearth furnaces.

Increase in Philadelphia district capacity was due almost entirely to addition of 450,000 tons capacity at Bethlehem Steel's Sparrows Point plant, now rated at 6.2 million tons.

The study again highlights the rising trend of electric furnace steelmaking capacity. During 1954 electric furnace capacity increased 3.48 pct, while openhearth capacity rose 1.04 pct, and bessemer capacity remained unchanged.

The biggest factor in the electric furnace capacity gain was the McLouth expansion which raised the electric furnace potential of the Detroit district by more than 14 pct—this on top of a 26 pct gain the previous year.

The industry's blast furnace capacity was increased 1,969,710 tons in 1954 to a total of 83,971,100.

IRON AGE DISTRICT CHANGES AT A GLANCE

IRON AGE	Pct of U. S. Capacity		Increase in Capacity		Pct of U. S. Increase	District Changes (Pct) By Type of Furnace		
	District	1955	1954	Net Tons	Pct	Open-hearth	Bessemer	Electric
Chicago	19.87	19.78	421,000	1.71	28.11	1.44	0.00	5.38
Pittsburgh	18.27	18.51	-28,910	-0.13	-1.93	-0.14	0.00	0.01
Philadelphia	13.40	13.18	472,660	2.80	31.55	2.73	0.00	7.72
Youngstown	11.08	11.18	43,200	0.31	2.88	0.44	0.00	-0.09
West	7.06	7.14	1,080	0.01	0.07	0.10	.....	-0.62
Detroit	5.39	5.27	232,220	3.55	15.50	0.00	.....	14.34
Buffalo	5.21	5.19	100,000	1.55	6.68	1.57	.....	0.00
Cleveland	4.96	5.02	0	0.00	0.00	0.00	0.00	.....
South	4.15	4.07	168,000	3.28	11.08	3.45	.....	0.00
South Ohio River	3.90	3.92	29,680	0.61	1.98	1.20	.....	-2.89
Wheeling	3.87	3.91	0	0.00	0.00	0.00	0.00	.....
St. Louis	2.26	2.24	60,000	2.15	4.01	2.28	.....	0.00
Northeast	0.58	0.59	970	0.13	0.06	0.00	.....	0.59
Total	100.00	100.00	1,497,900	1.20	100.00	1.04	0.00	3.43

Steel Capacity

♦ Steelmaking capacity in U. S. increased 1.5 million tons during 1954, now stands at 125,828,310 net tons per year . . . Blast furnace capacity increased nearly 2 million tons to 83,971,100.

♦ Philadelphia district gains most new capacity . . . Chicago increases its first place margin . . . Pittsburgh only district to decline . . . Detroit scores 14 pct gain in electric furnace capacity.

♦ STEELMAKING capacity in the United States now stands at 125,828,310 net tons per year—an increase of 1,497,900 tons from the level of Jan. 1, 1954.

The increase during 1954 compares with a boost of approximately 6.8 million tons during 1953, and a rise of 8.9 million tons during 1952.

In the 9 postwar years steel companies in the U. S. have jumped their total capacity 34 million tons, or about 37 pct.

Basis of this new compilation of the industry's potential by IRON AGE districts is the detailed official capacity report just published by the American and Steel Institute.

By adding 421,000 net tons of capacity during 1954, Chicago strengthened its position as the No. 1 IRON AGE steelmaking district. The new capacity in the Chicago district amounted to over 28 pct of total capacity added in the U. S. Chicago district capacity now comprises 19.87 pct of the U. S. total.

For the second year in a row Pittsburgh was the only district

to show a decline. Pittsburgh capacity slipped 28,910 net tons, but the district is still firmly entrenched in second place with 18.27 pct of total U. S. capacity.

Philadelphia registered the greatest capacity increase—472,660 net tons, or nearly 32 pct of the total U. S. gain. With 13.4 pct of total U. S. capacity, Philadelphia is now firmly established ahead of Youngstown (11.08 pct of U. S. total) which it vaulted 2 years ago with the building of U. S. Steel's Fairless Works.

Detroit Boosts Electric

Third largest capacity gain among the districts was scored by Detroit, which added 232,220 net tons, or 15.5 pct of the total U. S. gain. Detroit ranks sixth among the districts in total steelmaking capacity.

Increase in Detroit capacity was due entirely to expansion of electric furnace and oxygen steelmaking at McLouth Steel Corp.

Nearly three-fourths of the capacity gain in Chicago dis-

trict was achieved by Inland Steel Corp. which increased the capacity rating of its Indiana Harbor Works by 300,000 tons per year. Most of this increase was credited to use of oxygen in openhearth furnaces.

Increase in Philadelphia district capacity was due almost entirely to addition of 450,000 tons capacity at Bethlehem Steel's Sparrows Point plant, now rated at 6.2 million tons.

The study again highlights the rising trend of electric furnace steelmaking capacity. During 1954 electric furnace capacity increased 8.43 pct, while openhearth capacity rose 1.04 pct, and bessemer capacity remained unchanged.

The biggest factor in the electric furnace capacity gain was the McLouth expansion which raised the electric furnace potential of the Detroit district by more than 14 pct—this on top of a 26 pct gain the previous year.

The industry's blast furnace capacity was increased 1,969,710 tons in 1954 to a total of 83,971,100.

IRON AGE DISTRICT CHANGES AT A GLANCE

IRON AGE	Pct of U. S. Capacity		Increase in Capacity		Pct of U. S. Increase	District Changes (Pct) By Type of Furnace		
	District	1955	1954	Net Tons	Pct	Open-hearth	Bessemer	Electric
Chicago	19.87	19.78	421,000	1.71	28.11	1.44	0.00	5.38
Pittsburgh	18.27	18.51	-28,910	-0.13	-1.93	-0.14	0.00	0.01
Philadelphia	13.40	13.18	472,660	2.80	31.55	2.73	0.00	7.72
Youngstown	11.08	11.18	43,200	0.31	2.88	0.44	0.00	-0.09
West	7.06	7.14	1,080	0.01	0.07	0.10	.....	-0.62
Detroit	5.39	5.27	232,220	3.55	15.50	0.00	.....	14.34
Buffalo	5.21	5.19	100,000	1.55	6.68	1.57	.....	0.00
Cleveland	4.96	5.02	0	0.00	0.00	0.00	0.00	.....
South	4.15	4.07	186,000	3.28	11.08	3.45	.....	0.00
South Ohio River	3.90	3.92	29,680	0.81	1.98	1.20	.....	-2.89
Wheeling	3.87	3.91	0	0.00	0.00	0.00	0.00	.....
St. Louis	2.26	2.24	60,000	2.15	4.01	2.20	.....	0.00
Northeast	0.58	0.59	970	0.13	0.06	0.00	.....	0.59
Total	100.00	100.00	1,497,900	1.20	100.00	1.04	0.00	3.43

Report To Management

Budget Based on High Level Prosperity

From the President's Budget Message, one fact sticks out clearly: the Administration is counting on a high level of prosperity in fiscal '56, considerably higher than most government sources indicated even in the highly optimistic business forecasts they made at the end of last year.

This shows up particularly in the Treasury Dept.'s estimate that government revenues in fiscal '56 will amount to \$60 billion, up \$1 billion from fiscal '55. Since taxes were cut a whopping \$7.4 billion during 1954, it means that without this tax cut, budget receipts during fiscal '56 would be up at least \$7.4 billion to a total of \$67.4 billion.

If taxes had not been cut, budget receipts for fiscal '56 would set an all-time high, topping the previous record income of \$64.7 billion established in fiscal '54 (although this figure would also be upped slightly if the '54 tax cut had not been made, though not by nearly so much since the tax cuts were in effect for only part of the fiscal year).

In making its estimate of budget receipts, the government is figuring that personal income will rise from \$286.6 billion in calendar year 1954 to a record high of \$298.5 billion this year. Treasury Dept. also believes corporate profits, which were running at an annual rate of \$34.5 billion in the first half of last year and \$36 billion during the second half, will go up to \$38.5 billion this year. It means the government figures 1955 will be an exceptionally good (perhaps the best ever) year for both business and wage earners.

Production Highest in 14 Months

Federal Reserve Board's Industrial Production Index picked up another point in December, hitting 130, highest it's been since October 1953. For the year, the FRB Index averaged 125 compared with 134 in 1953.

As in November, output of durable goods, supported by full-tilt production in the auto industry, continued to gain. Manufacture of household durables remained steady at a level about 25 pct above the year-ago rate. Activity in military equipment industries showed little change from the reduced production level reached this fall.

Employment in auto plants has been on the rise, but total non-agricultural employment at 48.3 million changed very little from November. Average work week at factories climbed seasonally to 40.5 hours compared to 39.3 hours in December 1953. Hourly earnings were unchanged but average weekly earning, reflecting the increase in the workweek, rose to a new high of \$74.12. And unemployment which usually rises at this time of year declined slightly to 2.8 million.

Prices of industrial materials went up during December and early January. Caught in the price rise were aluminum, scrap metals and rubber.

Television Sales Set All-Time Record

Television industry continues to surge. Retail sales during the first 11 months of 1954 set a new record, totaling 6.2 million sets compared with 5.6 million sets sold in same period '53.

And despite record-breaking pace of TV retail sales, radios aren't doing badly either. In the January-November '54 period nearly 5.3 million radio sets were sold as against 5.6 million in the first 11 months of 1953.

Construction Costs Edge Up

As construction continues to boom it is also becoming more costly to build. American Appraisal Co.'s Construction Cost Index (covers cost of both labor and materials) rose 3 points during the fourth quarter. Total rise in construction costs during 1954 amounted to 2.2 pct compared with a 3.2 pct increase during 1953.

INDUSTRIAL
BRIEFS

New Service... Detroit Sintered Metals Corp. offers a new service to design engineers and production men. Bars of powdered metal 1½ in. diam by 2½ in. long will be supplied in any quantity from one up for experimental purposes on new parts or redesigned old parts.

Gets Order... Blaw-Knox Co., Pittsburgh, has received an order for nearly a half-million dollars for two 62-in. wide aluminum foil mills from The Kaiser Aluminum & Chemical Corp., to be installed late in 1955 at Kaiser's new plant in Ravenswood, W. Va.

Hear Ye... Colson Corp., Elyria, Ohio, has become a wholly-owned subsidiary of F. L. Jacobs Co., Detroit.

Purchased... South Chester Tube Co., Chester, Pa., purchased Dodge Steel Co., Tacony, Phila., Pa. The newly acquired firm will be operated as a separate and wholly-owned subsidiary.

Expansion... Hubbard & Co., Pittsburgh, completed a \$1.5 million expansion and modernization program at its three major plants in Oakland, Chicago and Pittsburgh.

Well Rewarded... Employees of Harnischfeger Corp., Milwaukee, have earned a total of \$10,578 in prizes through their participation in a suggestion contest to aid a company-wide cost-saving and quality program. Top award went to Anton Wallner, a hoist shop foreman.

Production Scheduled... Newport Steel Corp., Newport, Ky., opened its new reversing cold reduction mill this week. The mill was recently installed as the major item in the firm's \$9 million expansion program.

Acquired... Baker Brothers, Inc., Toledo, has acquired certain assets of the Hall Automotive Equipment line of the Waterbury Tool Div. of Vickers, Inc.

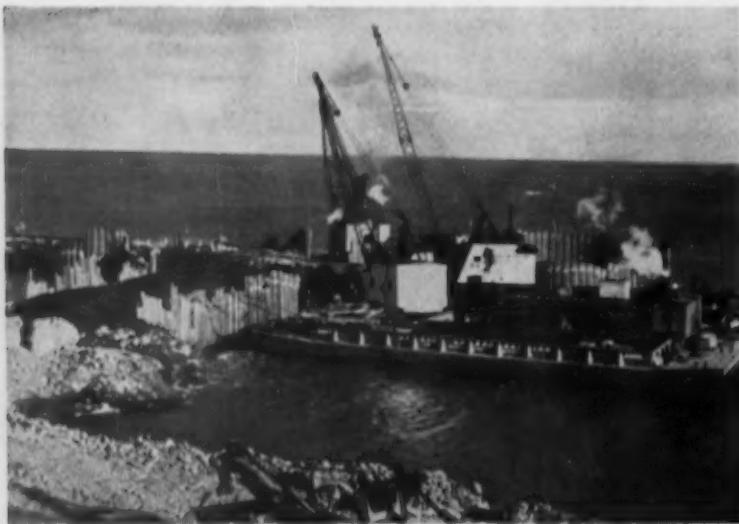
Will Build... Weirton Steel Co., division of National Steel Corp., will begin construction in the spring on a new three-story General Engineering Department Building at the corner of Pennsylvania Ave. and Delaware St., Pittsburgh.

Incorporated... McCrady Refactories, Inc., has been incorporated under Pennsylvania law. The company will continue to represent other manufacturers for the sale of blast furnace carbon brick and shapes, fire brick, foundry sands and loam.

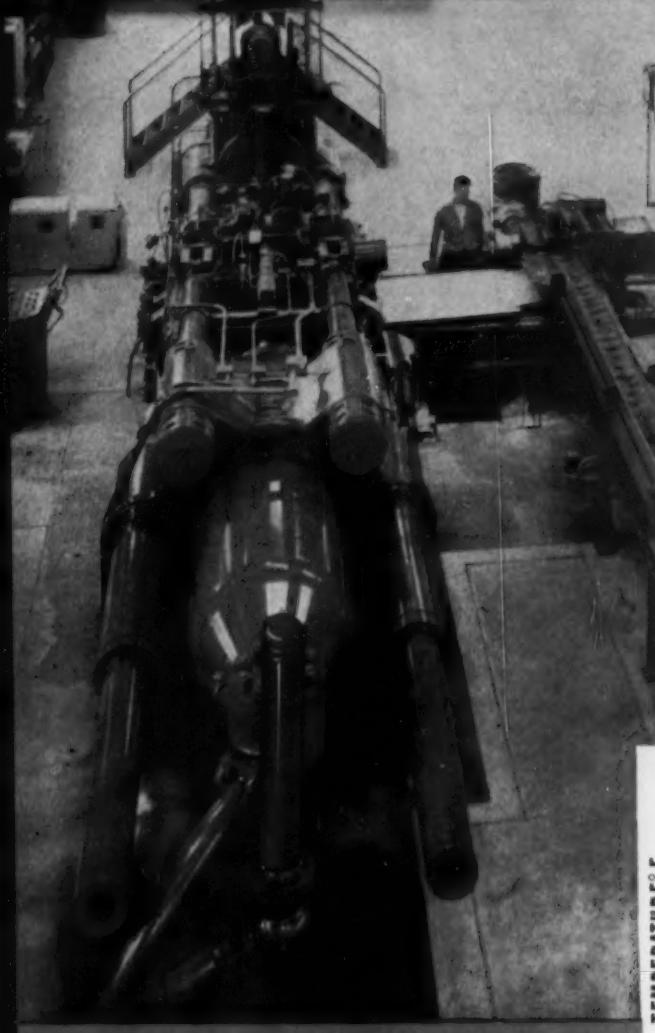
Plan Merger... A. M. Byers Co. and Erie Forge & Steel Corp. have agreed to a merger and stockholders' meetings are to be called to consider and approve it. The merger would result in the Byers-Erie Corp.

Rep Appointed... Columbia Tool Steel Co., Chicago Heights, Ill., has appointed the W. H. Schulz Co., Inc., St. Paul, as its representative there.

Acquires Land... General Electric Co. has acquired, under option, more than 4500 acres of land in Adams County, Ohio, near the city of Peebles. The land will be used for testing advanced models of jet engines and components.



MULTI-MILLION DOLLAR harbor for loading freighters with taconite ore is under construction on Lake Superior, 75 miles above Duluth. Crews of Dravo Construction Co. are shown building cofferdams around excavation areas. Taconite Harbor is part of \$300 million project of Erie Mining Co. for processing and shipping taconite ore pellets.



Heating 5" diameter stainless steel billets in a Magnethermic Induction Heater prior to extrusion.

CARBON STEEL FREQUENCY SELECTION CHART								
TEMPERATURE° F	2400° F	1600° F	800° F	HIGH-FREQUENCY	DUAL FREQ.	LOW-FREQUENCY		
2"								
4"								
6"								
8"								

FORGE WITH INDUCTION HEATING AND DO A BETTER JOB

With induction heat, a 5" diameter steel billet reaches forging temperature in less than five minutes. This rapid heating cuts operating costs by minimizing scale loss, maintenance costs, manpower and floor space. The equipment can be fitted into an automatic processing line, making billet pre-heating just one minor step in a forging operation. This is why modern production forging and extrusion plants are buying induction heating equipment.

Regardless of size of work or frequency, Magnethermic builds the equipment to meet your need. This company specializes in Induc-

tion Heating equipment, low-frequency or high-frequency, through 10,000 cycles. Write to Magnethermic for bulletin or information about your specific questions.

60 THROUGH 10,000 CYCLES

INDUCTION HEATING
MAGNETHERMIC
corporation

3990 SIMON ROAD YOUNGSTOWN 7, OHIO

60 THROUGH 10,000 CYCLES



Motorama Is Industry's Biggest Show

Extravaganza serves as new model backdrop . . . Is stage for GM's big announcements . . . Dream cars are displayed to test public's reaction to style, design innovations for tomorrow's cars—By R. D. Raddant.

• ONCE AGAIN General Motors converged on New York with its fabulous Motorama last week and as Vice-President Paul Garrett understated it: "Let it be no secret that one reason is to display our new, 1955 products."

That, of course, is the basis for the tremendous expense involved in the big show. But it has an even greater significance, not only to General Motors, but to the auto industry as a whole.

The auto industry is still comparatively youthful, about 50 some years old. As such, it is still somewhat in the "nouveau riche" class when compared with established fields such as steel-making, railroads, commerce and other businesses that have their roots in history.

Invades New York . . . So General Motors gets tremendous satisfaction from invading New York once a year and using the Motorama in the Nation's largest city as a backdrop for its new cars and for pronouncements by its

president that may be of national significance.

Later, the show will be duplicated in other large cities across the continent, but the so-called "Waldorf Show" is the big push and will always be the real backbone of the Motorama's tour.

Measure Public's Pulse . . . But aside from a dramatic display of products and the provision of a national sounding board, the Motorama has other important functions. One of the most satisfactory is the display of dream cars. With their futuristic styling and advanced engineering, they provide one of the best methods to feel the public pulse, and map future merchandising plans.

As evidence of this, one has only to look at this year's market cars and compare them with last year's dream cars. In fact, the Chevrolet Corvette, introduced last year, and the new Chevrolet Nomad, just announced for the market, are 1954 dream cars that became 1955's reality.

In addition, it gives the non-automotive GM divisions a chance to show what they can do in the way of engineering and research exhibits and the appliance wonders of the Kitchen of Tomorrow.

Launch Trial Balloons . . . But taking the dream cars as one of the most vital parts of the show, they all display new features of design that are being shown to the public for reaction. While there isn't room to describe each in detail, here are some features that may be seriously considered for future production.

Chevrolet's Biscayne has a 3-way panoramic windshield with an Astra-Dome effect that could very well become a reality if the public indicates that it wants upward visibility.

The Pontiac Strato-Star features automatic access panels that raise above the doors as they are opened. Particularly since the advent of the wrap-around windshield, getting in and out of a car has become more difficult than



DELTA, Oldsmobile's plastic-bodied 4-passenger dream car with aluminum roof and wheels. Seats swivel out when doors open to ease entry. Power is 250 hp.



LA SALLE sportster could mean a GM trial balloon presaging possible reintroduction of Cadillac "junior partner." V-6 engine has fuel injection.

you have
PRECISION
 at your
 finger-tips
 with a
BULLARD
SPACER



A call to
 your **BULLARD**
 Representative
 will convince you
 of the savings a
 Bullard Spacer
 will effect in your
 manufacturing methods,
 or write to...
 The Bullard Company
 Bridgeport 2, Connecticut

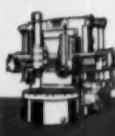
In plant after plant, in many diversified industries, The Bullard Spacer, day after day is convincing management and shop people alike, that where precision counts it is a "natural."

At the San Diego Division of Convair, a machine shop Superintendent says: "We have found the Bullard Spacer very useful in our work. The machine is simple to operate. It eliminates the necessity of zeroing to a set position and there is no chance for error, which is important when you make accurate parts for airplanes."

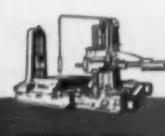
Accurate and precision drilling, reaming or tapping to exacting standards on difficult pieces without the high cost of jigs or fixtures, is maintained with a Bullard Spacer.



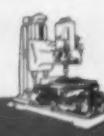
CONVAIR-G-MATIC



BULL-PAIR



HORIZONTAL SPACERS



MACHINE TABLE



BULL-SPACER



BULL-AIR-MATIC

THE BULLARD COMPANY • BRIDGEPORT 2, CONN. Tel. EDISON 6-2511



MIDVALE "PUTS TEETH" IN MARINE DRIVE

This 159½" I. D. gear tire for the reduction gear in a high speed marine drive is receiving the rough machining at Midvale. From pour to machining it has been built for toughness . . . higher resistance to wear.

Toughness of forgings at Midvale is achieved by using only the finest part of the ingot originally poured. Experienced forgers shape it up for rugged service using a 6,500 ton hydraulic forging press. Heat treating cycles based on Midvale's long experience are thoroughly followed to produce the maximum in mechanical properties.

Final machining is done on equipment capable of handling rough or finish machining on practically any size product.

At Midvale the final gear tire represents only a fraction of the original ingot—73,500 pound ingot was required to make this gear tire which was 15,640 pounds in the rough machined state when shipped. This is one of the reasons Midvale gear tires . . . rings . . . roll shells are noted for their long life. Why Midvale forgings, whether 300 or 300,000 pounds are tough for extra service life and never failing performance. For forgings that last see Midvale first.

THE MIDVALE COMPANY-Nicetown, Philadelphia 40, Pa.

Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS



Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Jan. 22, 1955	169,704*	23,503*
Jan. 15, 1955	161,165	23,197
Jan. 23, 1954	121,157	25,584
Jan. 16, 1954	123,231	26,610

*Estimated. Source: Ward's Reports

both automakers and passengers like and this type of panel could be the answer.

Show New Panel . . . On Oldsmobile's 88 Delta, the outstanding feature is an instrument panel consisting of a detached horizontal strut extending from side to side below the steering wheel to carry all the instrumentation. If the public indicates that it likes the effect, it may have a chance to buy it soon.

The only convertible in the dream car group is Buick's Wildcat III. The best feature possibility here for eventual production is a compound windshield designed to lessen the wind-noise problem, an unsolved question as old as the automobile itself.

The Cadillac Eldorado Brougham also flirts with the ingress-egress problem. Its possible solution is a seat that pivots outward to permit easy entry and guarantees not to knock off the passengers' hats.

Made Important Announcements

. . . A batch of other important announcements went with this year's Motorama. They included: An offer to buy back any surplus cars from dealers to combat bootlegging; disclosure of engineering work on a light-weight train; a \$2-million-a-year aid to education program; and an indication that GM is not afraid of surpassing a 50-per-cent-of-the-market sales figure.

Chevrolet and Pontiac also announced simultaneously that they will produce dream car station wagons in the Chevrolet Nomad that appeared at last year's Motorama and Pontiac's Safari, a similar version for this division. These station wagons are ultra-streamlined, replacing the traditional boxlike body of station wagon styling with a low, smooth silhouette.

Chrysler Leads Race

The rest of the industry found it tough going newswise to combat GM last week, but Chrysler attracted considerable attention with announcement of a 300-hp car fitted with a special suspension that makes it a real ground-hugger.

The car will go into production within the next six weeks and will be available for purchase in March. It puts Chrysler back on top in the horsepower race after a short time in which the title was held by Packard with its 275 hp Caribbean.

LaSalle:

New dream car might spark return of dropped GM line.

Harlow H. Curtice, GM's forward-looking president, admitted at a press conference that the presence of two LaSalles could be a re-introduction preview of this former junior partner of Cadillac. These are highly styled cars, but the real features of importance are their V-6 engines.

Everyone knows that the auto industry has worked on a V-6 for

AUTOMOTIVE NEWS

years, but without much success. However, the fuel injection system utilized in these engines may be a clue to a possible solution of some of the V-6's problems. The fact that the engines are a modest 150 hp may mean that GM will try a V-6 in a lower-powered car if the public interest should turn that way.

Of course, none of these may materialize, but they were put there for a reason. Neither GM nor its competitors will hesitate to move if the car buying public sees something it wants.

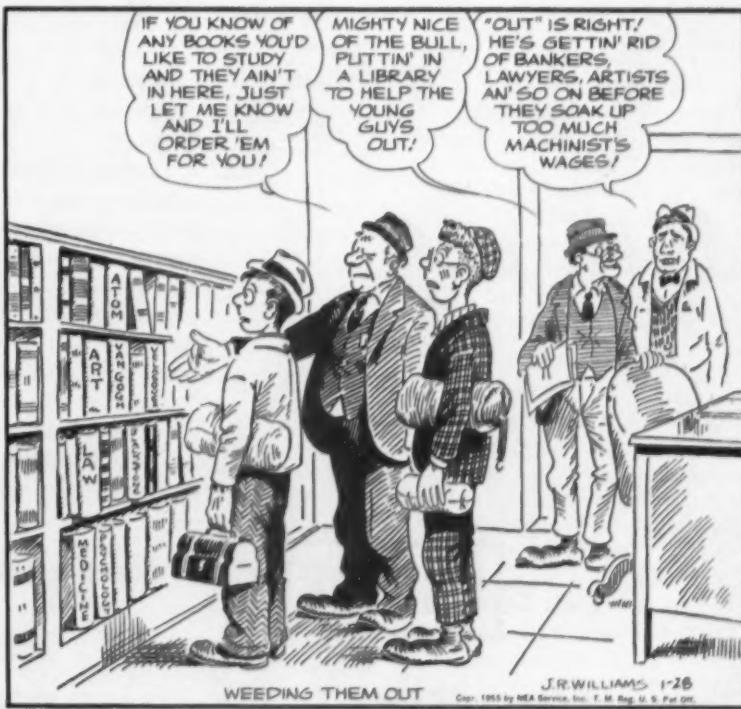
New Studebakers Bow

Studebaker's midseason model change resulted in 12 new models with wraparound windshields and higher horsepower. Studebaker had considered the move months ago, but final go-ahead was not given until after the Studebaker-Packard merger.

In horsepower, the President was stepped up from 175 to 185 and the Commander from 140 to 162. A power package is optional.

THE BULL OF THE WOODS

By J. R. Williams





a hole here costs money...



a hole here saves money

Crucible Hollow Tool Steel Bars put savings into the pockets of the metalworking industry. There's no need for costly drilling, boring, cutting-off or rough-facing operations. For the hole is already in the steel you buy. You save production time, machine capacity—avoid scrap losses.

Crucible Hollow Tool Steel Bars are now available in any of our famous tool steel grades . . . in almost any combination of O.D. and I.D. sizes. And you get *immediate* delivery of five popular grades — KETOS oil-hardening, SANDERSON water-hardening, AIRDI 150 high-carbon high-chromium, AIRKOOL air-hardening, and NU DIE V hot-work tool steels.

Your Crucible representative can show you how to save time and money with Crucible Hollow Tool Steel Bars. *Crucible Steel Company of America, Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America



Democrats Hope for Tariff Fight

Ike's request for tariff cut faces long debate because Democrats hope to show lack of unity in Republican Party on this issue . . . Ike's requested 15 pct tariff reduction not likely to get OK—By G. H. Baker.

• DEMOCRATS are anxious for debate to start on Ike's request for tariff-cutting powers. Split as they are on this issue, they find they're not so badly divided as Mr. Eisenhower's own party. As a result, they plan to force the tariff issue into prolonged debate to emphasize the lack of unity within Republican ranks.

Despite the noble arguments for low tariffs presented by men like George Humphrey, Sinclair Weeks, and Charles Wilson, it is doubtful that Congress will legislate the 15 pct reduction that Ike asks. More likely outcome: A 3-year extension of the existing Reciprocal Trade Acts, with little if any tariff-cutting power.

Another Dixon-Yates? . . . Power-hungry atomic plants in the Tennessee Valley are forcing the Eisenhower Administration into another Dixon-Yates controversy.

Constantly-rising demands for electric power by the Atomic Energy Commission will soon offset the 600,000-kw gain in output that the Dixon-Yates plant will supply. Additional generating plants soon will be necessary. Since atomic demands are expected to triple in the next 2 years.

Mr. Eisenhower and AEC General Manager Kenneth D. Nichols will have to decide whether or not to risk letting another contract for power to private industry or whether to let TVA build more plants.

Boost for Anthracite . . . The Pennsylvania anthracite region is to get a \$17 million shot in the arm this spring, if Congress ac-

cepts President Eisenhower's advice for sparking new business activity in that depressed area.

Mr. Eisenhower asked Congress to vote \$8.5 million to build draining projects. State of Pennsylvania would put up a like sum, under the proposal.

Idea behind the program is to prevent flooding of valuable resources. It would also prevent the loss in employment which would result if additional mines were closed.

More Tinplate for Spain . . . The \$8 million being allotted the Spanish steel industry by the U. S. government is to be equally divided between expansion of blast furnace capacity and rolling mill ca-

pacity. One of Spain's most pressing needs is for a fast increase of about 60,000 tons in the annual production of tinplate. The now-thriving Spanish fish-canning and fruit and vegetable canning industries are in desperate need of more tinplate.

Congressmen who recently toured key industrial works in Spain say the greatest gap between Spain's needs in steel products and actual production is in crude steel and cold-rolled flat steel, particularly tinplate.

Ask More for Census . . . President Eisenhower is asking Congress to approve another \$4.6 million to complete the censuses of business, manufacturing, and mineral industries.

The new appropriation would be in addition to the \$8.4 million authorized last year. The first appropriation covers the cost of field work—collecting and checking the information. The new money would pay for tabulating and publishing the results.

Included are funds for preliminary work for a future census of transportation, originally scheduled for last year.

No Auto Tax Cut . . . An end to federal excise taxes on trucks, buses, autos, tires, tubes, and automotive parts and accessories is called for in new federal legislation introduced by Sen. Charles E. Potter, R., Mich.

Passage of his proposal would serve as "a shot in the arm to the economic health of the country," Sen. Potter says. But the bill has little chance of passage this year.

Turn Page

**MACHINING COSTS
CUT 40%**

...ON JET RINGS

By switching to flash butt-welding of extruded sections, we helped one customer cut fabricating costs of a jet engine ring from \$67.85 to \$41.93. A saving of \$25.92 per ring — roughly 40%.

This is one of many cases in our files where rolling and flash butt-welding of bars, sections, extrusions or plate has proven to be the most economical and practical method of fabricating circular components. Shown below are some other "American Welded" components.

If you require a similar part, it is very likely that this type of fabricating can cut your costs. Why not write our Product Development Division today? They will be glad to study your problem.

THE AMERICAN WELDING & MANUFACTURING COMPANY
120 DIETZ ROAD • WARREN, OHIO



MACHINED RINGS

Round and bush-welded rings, machined to exact specification and delivered ready for assembly.



WHEEL AND RIM ASSEMBLIES

Weldment of carbon steel bar and plate for use on heavy earth-moving equipment.



COMPRESSOR CASES

Welded bond for hermetically sealed refrigerator compressor.



SPECIAL MILL ROLLED SECTIONS

Amweld can show you how to save critical material and valuable machinery time by use of these sections.



TURBINE FRAME ASSEMBLIES

Formed sheet metal bands and flash butt-welded rings fabricated into a jet engine component.



NOZZLE BOXES

Complicated welded assemblies of machined rings and sheet metal.



MOTOR FRAMES

Steel bars and plate formed and welded into industrial motor frames.



Send for free catalog of American Welding Products Facilities.

AMERICAN WELDING



WELDING • MACHINING • FABRICATING

President Eisenhower in his State of the Union message, calls for continuation of the present excise rates, while holding out hope that they may be reduced in 1956.

The 8 pct rate on truck bodies and chassis alone brought nearly \$150 million into the Treasury in fiscal 1954, the Internal Revenue Service reports.

Who Pays for Channel... Delaware Valley congressmen still think the government should pay for the dredging (actually, more blasting than dredging will be required) of the seagoing channel that's to be carved out of the Delaware River.

President Eisenhower, however, has made it clear that he favors cost-sharing on the part of the users of the new channel. In huge projects of this type, he says, he wants to see maximum local participation. He suggests that a system of toll charges would be one way of financing the local share of the project. But he leaves it up to Congress as to the exact method of financing.

Farm Machines:

Manufacturers expect better business this year.

Producers of farm machinery and equipment are preparing to tempt buyers with the greatest variety of new tractor models to be offered in any year since 1941.

Machinery makers are also planning more aggressive sales campaigns and now are predicting to U. S. Commerce Dept. that business will equal or better 1954's.

Basis of this prediction is the cleanup of dealers' inventories, placing dealers in a receptive position as regards new models.

Tractor Sales Dip

Initial Commerce Dept. estimates indicate a 10 to 12 pct dip in shipments of farm equipment items last year, as compared with 1953 figures. Estimates were derived from a study of reports from businesses representing 75 to 85 pct of the industry sales volume.

Tractor sales in 1954 declined 30 to 35 pct, while sales of other products were closer to 1953.

The domestic market for farm machinery, forming about 85 pct of sales by the industry, was off more than the total, but export sales gained by 5 to 10 pct.

WASHINGTON NEWS

are not the answer to our highway problem and that the interstate system should be toll free. Others propose that total responsibility for the interstate road system be given to a national turnpike authority.

Highways:

See trouble in financing 10-year improvement plan.

Cost apportionment is the most sensitive single issue related to the highway modernization program proposed to Congress by President Eisenhower.

Splitting the costs of this operation equitably among federal, state, and local governments is a basic part of the financing task—and financing, as seen by many congressmen is the toughest problem to be faced in creating a road and street system adequate to heavier traffic needs.

Congress is to provide a start this year on an expanded program of highway building and improvement. There is no firm evidence, however, that many states are prepared to dig up the funds to begin a 10-year operation that could cost their governments and local governments more than \$25 billion. Some experts see no chance at all of putting the state portion of the over-all program across in the next 2 years.

Most controversial angle of the roadbuilding program is toll roads. Some hold that toll roads

Spending:

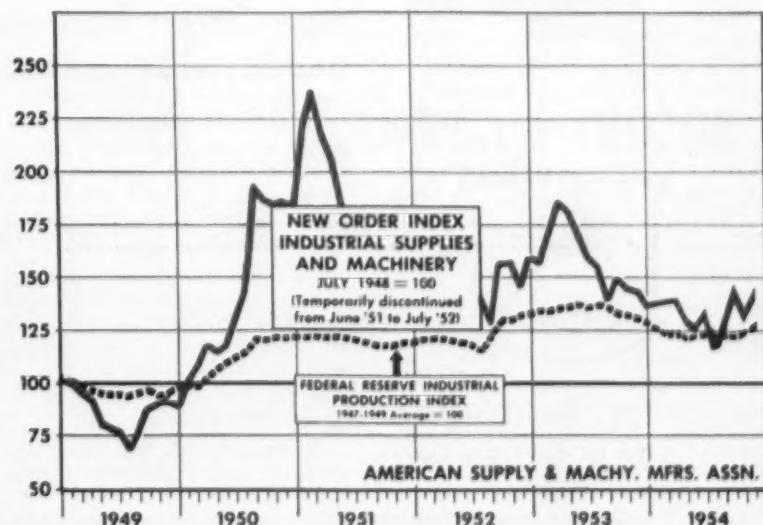
Reserve Board will survey consumer purchasing plans.

Federal Reserve Board will survey 66 areas during January and February to determine how consumers changed their spending and saving habits last year and what their prospects are for 1955.

Individual addresses are selected at random, and information obtained is confidential. Names are not requested.

The survey will include questions regarding consumers' incomes, general financial positions and attitudes about their current and prospective financial situation. Other questions relate to present housing arrangements and any changes which may be made in the near future.

Information will be asked about plans to buy cars and household appliances in 1955, and amounts of savings and debts.





Geoffrey Biggs

How Correct Lubrication cured them—and saved 37 production hours per week!

SOCONY-VACUUM



Correct Lubrication

FIRST STEP IN CUTTING COSTS

You could almost set your watch by it. At first, everything was normal. Then—slowly, mysteriously—it happened...the "jaws" gradually stiffened, moved more and more erratically, finally froze rigid. "Lockjaw" had set in again!

It was happening in a large auto plant. Twice a day five big lathes were shut down for 45 minutes while the chucks—or "jaws"—were cleaned and repacked with fresh grease so that production could continue on crank shaft forgings. All remedies had failed.

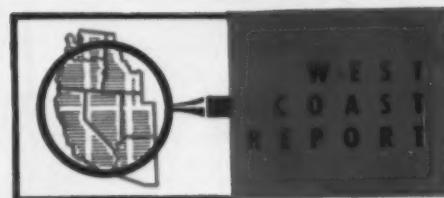
A Socony-Vacuum man discovered this situation while making an analysis

of the plant. Shocked by this huge waste of time and production, he asked one of his staff engineers to investigate.

This engineer studied the problem, made lab tests, found that cutting coolant, continuously splashing over the chucks, caused the grease to harden. He recommended a special Gargoyle grease—Sovarex #1. It cured the "lockjaw."

This is an actual case. It points up how much you may gain by using *Correct Lubrication*—top-quality products plus the world's greatest lubrication knowledge and engineering service. Can you afford to accept anything less?

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION



Trailer Boom Adds to Steel Demand

Trend is toward huge, 45 ft, 10,000 lb "homes on wheels" . . . Owners move but twice yearly . . . Built of steel for strength, economy . . . Southern California builders sell 25 pct of \$300 million U. S. total—By R. R. Kay.

• **HOUSE TRAILERS** are becoming more house than trailer. The accent is on living, not travelling. This shift in demand is opening new markets for steel products.

And the latest "dream homes on wheels" and "mobile mansions" are going on display at the Trailer Life Show in Los Angeles, Jan. 31 to Feb. 6.

THE IRON AGE surveyed leading southern California trailer manufacturers, who sold some \$75 million worth of trailers last year (national sales: \$300 million). They report a definite shift in demand from camping- and traveling-type units to heavier, more substantial "homes on wheels." This augers well for the metal-working industry.

Seek Portable Homes . . . Almost three-fourths of the 70,000 units that came off the nation's house trailer production lines in 1954 were designed to meet the growing call for compact, small homes. The buyer wants to beat the high cost of land-based residences.

The mobile feature is now secondary. Manufacturers say the home-on-wheels buyer now averages only two moves a year. Instead of casually hitching up and moving off down the highway, he now calls in a trailer transportation company to do the hauling.

Use More Steel . . . With the longer 35-45-ft trailers, built for more stationary living, the market for steel products expands. Chassis construction calls for longer, heavier channels. Steel, more rugged than plywood, and

giving cheaper square foot coverage than aluminum, is finding its way, in 24- and 26-ga flat rolled sheets, into sidewall and roof paneling; in galvanized for flooring; in stampings for flashings, vents, and ducts.

Today, almost any standard-sized steel product for the land-based home can find a market in the trailer manufacturing industry: plumbing pipe, bathroom fixtures, kitchen equipment. This goes for standard-sized home appliances, too: stainless steel ranges, garbage disposals, washing machines, air conditioning units, electric refrigerators, stoves, TV sets. Even pianos and electric organs.

Need Local Suppliers . . . Southern California's trailer builders, who make roughly 25 pct of the nation's total, are searching for West Coast sources of oil burning heaters, electric brakes, and cabinet hardware. There's room for additional sources of axles, plumb-

ing fixtures, nails, and screws.

Business looks good for quite a few years, they forecast. Over two million people in the U. S. now live on wheels, and 175,000 are added each year.

Industry Hits Road . . . Industry, too, is hitting the road. Special orders are coming through for traveling executive offices and display rooms; field accounting offices and diners for construction industries; instrument laboratories for the aircraft industry; and classrooms with projection equipment for training films.

Trailer costs range from about \$1000 for the small camping units to \$8000 for the 45-ft travelling palaces. House trailer weights run close to 6500 lb for the 35-ft length, and 10,000 lb for the 45-ft size.

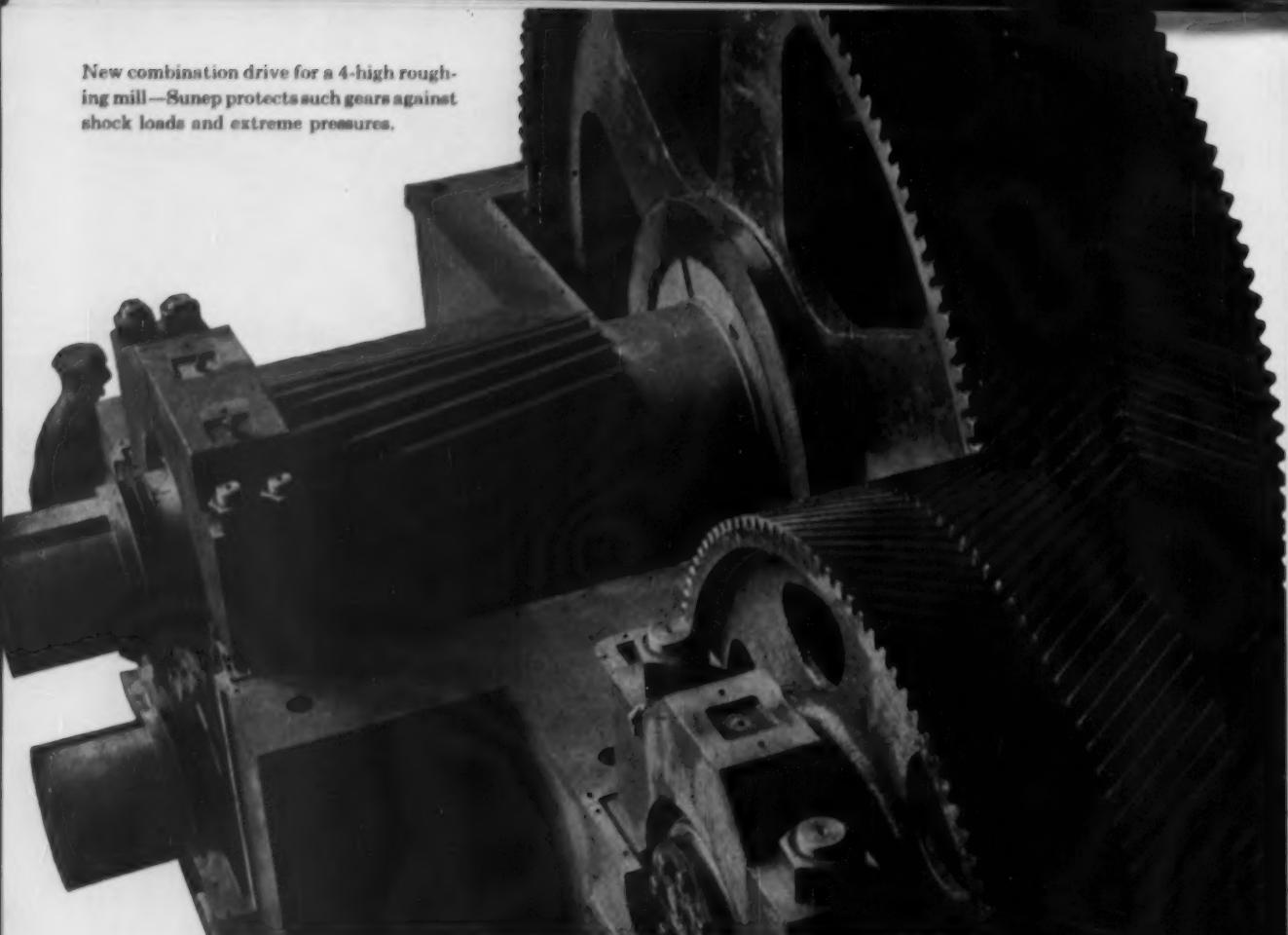
Kaiser To Fabricate . . . There are reliable reports on the West Coast that Kaiser Steel Corp., Oakland, Calif., is entering the steel fabrication business through purchase of Union Steel Co., Los Angeles, steel fabricators and constructors. With Consolidated Western Steel, Div. of U. S. Steel, and Bethlehem Pacific Coast Steel Corp. already big in the field, Kaiser's entry would put the three major West Coast producers in brisk competition for the growing steel fabricating business here.

American Motors Corp. is reopening its El Segundo (Los Angeles area) plant for assembly of Nash Ramblers. Closed since last August, the plant will need 600 employees to reach the single-shift capacity of 90 cars a day.



"Go ahead. But remember, you can't keep a good man down."

New combination drive for a 4-high roughing mill—Sunep protects such gears against shock loads and extreme pressures.



HOW SUNEP (Extreme Pressure Oil) EXTENDS GEAR LIFE

The advantage of running your machines at high speeds and under heavy loads can be quickly lost if your extreme pressure lubricants turn thick, lose film strength, or cause gears to corrode.

Sunep gives your gears better protection longer. Unlike many E.P. oils, Sunep is made from highly refined, premium grade oils skillfully blended with chemical additives that do not drop out during operation or in prolonged storage. This accounts for several rare user benefits: long life at extreme pressures;

absence of corrosion—even on bronze; rust protection for steel parts; clean gears and bearings as a result of the oil's high stability.

Primarily a lubricant for enclosed gears, Sunep has proven to be highly effective on bearings and screws working under extreme pressures. Because of its exceptional clinging characteristics, Sunep guards against metal-to-metal contact during the early moments of machine operation after shutdown. **FREE BULLETIN.** Tells all about Sunep. Get your copy. Write Dept. IA-1.

**INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY**

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL
Refiners of famous High-Test Blue Sunoco Gasoline





December Orders Show A 76 Pct Gain

Final month was best since October '53 . . . Shipments were up 13.5 pct over November . . . Uptrend will stretch the near-zero backlog . . . New installment plan matches payments with tax depreciation—By E. J. Egan, Jr.

• SANTA CLAUS did all right by the machine tool industry last month. He left a fat bundle of new orders under many a builder's Christmas tree. All together they totaled enough to give the industry its best new business month since Oct., 1953. The unexpected year-end rush to buy metalworking equipment sweetened what had started out to be a pretty sour final quarter.

National Machine Tool Builders Assn. estimates the December new order index at 203.2. That's a shade better than a 76 pct gain over the final November index of 119.5. Furthermore, it's almost 36 pct better than Dec. 1953 rate.

Shipments Up Too . . . Machine tool shipments perked up last month, also. They closed out the year on a rising note, hitting an estimated 203.6 on the Assn.'s index. This wasn't the high spot for the year, however. That came back in March, when orders placed during the Korean emergency were still being shipped. But December shipments, practically all of them to civilian goods manufacturers, did gain about 13.5 pct over the November index of 179.5.

Net effect of this sudden reversal in new business is to firm up the industry's backlog. Work ahead had shrunk to about three month's production in the final 1954 quarter, down fast and steadily from a two-year backlog in the summer of 1951. Outside of the industry average, some firms have actually been near the zero point in backlogged business. But with renewed buying activity their work loads could start inching up.

Sources Unknown . . . Sources of last month's buying spurt can't be pinpointed. Nor can anyone tell for certain which tool types were best sellers. But industry officials do indicate that the automotive firms weren't in the market beyond a normal amount. And it's a clear fact that government

buying hasn't been especially brisk lately.

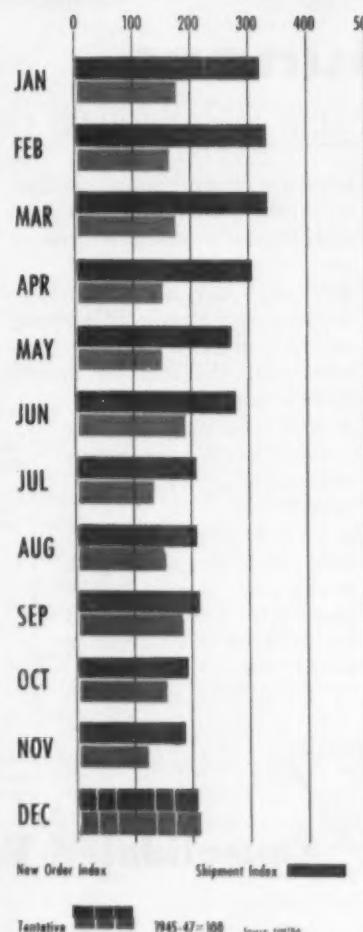
This leads to a fairly safe conclusion that the rank and file of metalworking plants are tidying up under pressure of competition, either actual or anticipated. Builders and distributors alike take a healthy share of the credit unto themselves. They cite more aggressive salesmanship, backed up by ever-better machine tools and tied in with down-to-earth talk about obsolescence and realistic depreciation.

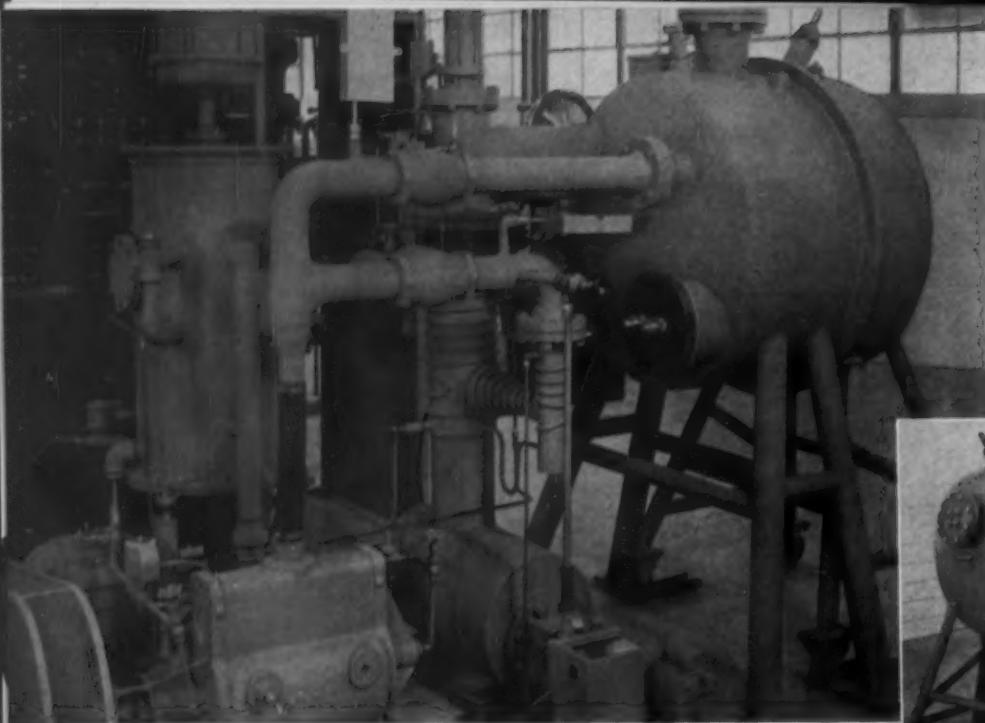
Builders generally are too cautious to state flatly that the December upturn is the start of a long term, climbing sales trend. But they're fairly confident that 1955 business will be better than it was last year, and hopeful it might be as good as 1953.

Offer Installment Plan . . . Fellows Gear Shaper Co. is offering its customers an installment purchase plan which stretches machine tool payments over 10 years. The plan is tailored so that the customer's total payment each year will approximate his allowable annual tax deduction on the new, accelerated depreciation schedules. Down payments will be flexible, but generally will be 25 pct of the purchase price.

Financing will be handled by C.I.T. Corp., which developed this pay-as-you-depreciate idea last October. Fellows' president E. W. Miller claims the plan's advantages would seem to make machine tool leasing obsolete. As a result, Fellows will no longer lease its equipment except in special cases.

MACHINE TOOLS 1954





The stainless steel shell of the new CVC high vacuum laboratory furnace is 36" in diameter by 38" long. The shell has a bridge-breaker, a 1" sight tube over the crucible, a 6" window at eye-level for general observation. The whole unit is 6½-feet high and requires 90 sq. ft. of floor area. Inset shows working area.



CVC announces

a new high vacuum metallurgical research furnace

Every part of CVC's new high vacuum laboratory furnace is designed for precise control and operating convenience. Here are the outstanding features—

1. Large vacuum pumping capacity is provided by CVC's KS-600, 2-stage diffusion-ejector pump which creates the low pressures (of the order of 10^{-4} mm Hg) required for a gas-free atmosphere, and provides ample capacity (up to 0.75 mm Hg) for handling the pressure surges that occur during alloy additions and pouring.

2. You perform general observations, alloy additions, tilt pouring, optical and/or thermocouple tem-

perature measurements, bridge-breaking, pressure readings, and high frequency control *all from one spot*.

3. A single semi-automatic, rotary sequence switch controls the pneumatically-operated valves, thus eliminating the need for manual operation.

4. You have a choice of five crucible sizes to accommodate melts of 5, 12, 17, 30 or 50 pounds.

5. Pre-pouring pressures range from 1 to 10 microns for a 50-pound melt of steel; correspondingly lower pressures are obtained when making smaller melts.

For detailed specifications on this new CVC laboratory vacuum furnace and for information on pilot or production type vacuum furnaces, write *Consolidated Vacuum Corporation, Rochester 3, N.Y.* (a subsidiary of Consolidated Engineering Corporation, Pasadena, California).

Typical performance of the new CVC high vacuum laboratory furnace with pumping system at normal heater input.

PRESSURE: Microns Hg	SPEED: Liters/Sec.	THROUGHPUT: Micron Liters/Sec.	THROUGHPUT: Micron Cu.Ft./Min.
.2	450	90	191
1.0	660	660	1,400
5.0	750	3,750	7,970
10.0	600	6,000	12,750
50.0	120	6,000	12,750
100.0	60	6,000	12,750

(Selective throughputs may be obtained by using the high, medium, and low heater switch mounted on the KS-600 pump.)



Headquarters
for High Vacuum

Consolidated Vacuum Corporation

ROCHESTER 3, N.Y.

sales offices: NEW YORK, N.Y. • CHICAGO, ILL. • BOSTON, MASS. • SAN FRANCISCO, CALIF. • CAMDEN, N.J.



The Iron Age

SALUTES

Willis Ehrhardt

Dynamic energies, creative talents have helped him in the building of a highly successful business against considerable odds, and enable him to perform valuable services for his community.

A strong compulsion to do a job thoroughly and well, despite apparently overwhelming difficulties, has characterized the career of Willis Ehrhardt, president of Ehrhardt Tool & Machine Co., St. Louis.

When he started his shop back in 1937 with but 12 employees, associates predicted failure. The precision work which Willis contemplated was traditionally imported from the North and East. People said that a high-precision tool and die shop—the first of its kind in the Mississippi valley area—would never take root.

Today, Ehrhardt Tool & Machine Co. has a modern plant, over 60 employees and an unquestioned position of reliability in the industry.

Willis' creative talents got plenty of chance to perform difficult jobs of precision tool making during World War II. A typical example is his development of a firing mechanism fuze booster gage. Faced with a specified tolerance of .0001 in. in locating pins on a tiny shaft,

Ehrhardt Tool & Machine engineered the job to reduce the tolerance to one-half the specified limit.

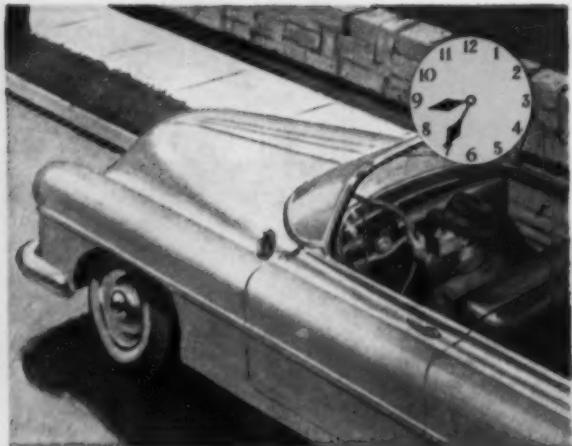
But Willis' energies and interests are by no means limited to his business. He's an enormous contributor to community activities—particularly scouting. He recently received the Silver Beaver Award, the highest honor a local council of the Boy Scouts of America can bestow upon an adult leader in its movement.

He's also sparked fund raising drives for hospitals and welfare organizations, is one of the early sponsors of the renowned St. Louis Municipal opera.

By efficient budgeting of his time Willis is also able to render no inconsiderable service to his industry. He is a founder of the St. Louis Army Ordnance Assn., served as president of the National Tool & Die Assn. in 1946, and today is vice-chairman of its planning committee. In addition he's been three times a director of the American Society of Tool Engineers.



8:30 A.M.—GARAGE. A lucky fellow, John rides to work every day in his car. This is his garage. Notice that it has a smooth-operating overhead door. What makes it swing up? A large spring. And—you guessed it—it's made from CF&I-Wickwire Wire.



8:35 A.M.—AUTOMOBILE. CF&I-Wickwire Wire contributes much to the comfort and efficiency John gets from his car. There's wire in the springs of the seat and back cushions. Also under the hood in the valve springs and the starter spring.

ROUND THE CLOCK
with
CF&I-WICKWIRE



8:45 A.M.—HIGHWAY. Notice the ribbon of concrete over which John's car rides smoothly to its destination. Many people, just like John, fail to realize that what holds it together is Welded Wire Reinforcement Fabric—another of the products that use CF&I-Wickwire Wire.



**FOR THE WIRE YOU REQUIRE
CHECK CF&I-WICKWIRE**

Watch for the balance of John's day in succeeding advertisements that take him to his office, through his plant and finally home to his living room.

CF&I-WICKWIRE WIRE
THE COLORADO FUEL AND IRON CORPORATION



WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Lincoln (Nebr.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

PERSONNEL

The Iron Age INTRODUCES

Edward C. Smith, elected president, **National Electric Welding Machines Co.**, Bay City, Mich.; and **William L. Mueller** and **Howard C. Cogan**, become vice-presidents.

P. O. Peterson, elected president and chief executive, **Mack Trucks, Inc.** **E. D. Bransome** will continue as chairman.

E. E. West, becomes president, **West Engineering Co.**, Richmond, Va.; and **E. E. West, Jr.**, becomes vice-president and treasurer.

Ted Operhall, elected president, **Misco Precision Casting Co.**

James B. Matson, appointed assistant to the president, **Cory Corp.**

Ralph W. Seely, appointed vice-president, sales, **Columbia-Geneva Steel Div., U. S. Steel Corp.**

A. R. Gaus, elected vice-president, **Erie Forge & Steel Corp.**

John D. Russell, appointed vice-president, engineering, **Joy Mfg. Co.**, Pittsburgh.

Pierce G. Fredericks, elected a commercial vice-president, **Federal Pacific Electric Co.**, Newark, N. J.

J. Gordon Hutchinson, appointed assistant comptroller, **Wheeling Steel Corp.**, Wheeling, W. Va.

Oliver A. Gottschalk, appointed assistant to the president, **The Carbide Co.**, Niagara Falls, N. Y.

Edward G. Kreyling, Jr., named director of Market Research, **Laclede-Christy Co.**, division of H. K. Porter Co., Inc.

L. W. Landay, elected chairman of the board of directors, **The M. N. Landay Co.**; and **Alan S. Landay**, becomes president.

Otto W. Franke, promoted to staff assistant to vice-president and operating manager, **Chrysler Corp.**, Detroit.

Edward W. Seymour, elected secretary, **Plume & Atwood Mfg. Co.**, Waterbury.

Joseph K. Balkwill, becomes senior research assistant, Engineering Research Group, **Electro Metallurgical Co.**, Metals Research Laboratories.

Clifford L. Christensen, becomes chief inspector, Toledo Div., **Dana Corp.** He succeeds M. L. Richardson who has retired.

Arthur P. Hickox, appointed general manager, Waterbury plant operations, **Scovill Mfg. Co.**

Roger J. Wighton, appointed a sales engineer, Chemicals Div., **Kaiser Aluminum & Chemical Sales, Inc.**



ERNEST R. SCHMIDT, becomes executive vice-president, **The Budd Co.**, Philadelphia.



HALTON A. COWARD, made executive vice-president, **The Budd Co.**, Philadelphia.



PHILIP K. DAVIS, appointed vice-president, **The Austin Co.**, Cleveland.



WALTER R. GRANT, appointed vice-president in charge of finance, **Studebaker-Packard Corp.**, Detroit.

John J. Murray and **Richard Doughton, Jr.**, appointed development engineers, Product Development Div., **Jones & Laughlin Steel Corp.**, Pittsburgh.

W. A. Morris, named new manager distribution transformer advance and development engineering, **General Electric Co.**

Elmer M. Pearson, appointed superintendent of steel conversion and quality control, **Republic Steel Corp.**, Chicago district steel plant.

Wilson H. Benson, named superintendent of aircraft maintenance, overhaul and modification operations, **Temco Aircraft Corp.**, Dallas plant.

John J. Waferling, appointed manager, Engineering Service Div., **Inland Steel Products Co.**, Milwaukee.

Harry E. Ladwig, named foundry consultant, **Allis - Chalmers Mfg. Co.**, and **Anthony Lebesch**, promoted to works manager, West Allis Works foundries and pattern shops.

Frederick B. Porteous, appointed manager, new can machinery plant, **E. W. Bliss Co.**, Canton, Ohio.

Laurence W. Hayward, named manager, new Contract and Erection Dept., **The Babcock & Wilcox Co.**

C. R. Grange, becomes manager, Dayton, Ohio district, **Air Reduction Sales Co.** He succeeds L. O. Geiger, who is retiring.

David H. Mackey, appointed sales manager, **Simonds Saw and Steel Co.**, succeeding C. R. Pafenbach who has retired.



FRANK M. CASHIN, appointed vice-president, **Kaiser Aluminum & Chemical Corp.**, Oakland, Calif.



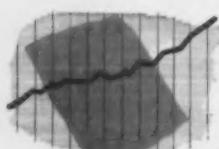
J. G. RICHARD HEKSCHER, made vice-president, **The Budd Co.**



ROBERT C. CUTLER, appointed vice-president and central district manager, **The H. K. Ferguson Co.**



DAVID A. WALLACE, becomes sales manager, **Cincinnati Lathe and Tool Co.**



Everyone recognizes this
as a sign of good business...

And smart gear users know
this **CINTI** is the sign of
the best in custom made gears.

May We Send You Our Brochure?



"Gears...Good Gears Only"

THE CINCINNATI GEAR CO. • CINCINNATI 27, OHIO

Count on

WEIRTON

HIGH-CARBON STRIP

COLD-ROLLED SPRING STEEL

for uniform high-speed
blanking and cold forming

Whether your problem is cold forming or blanking, you can depend on Weirton cold-rolled spring steel for best results. It has proved itself in a multitude of applications by consistently meeting the requirements of a variety of products where high fatigue-resistance is a principal factor.

Where superior forming qualities are of prime necessity, Weirton supplies spheroidized-annealed cold-rolled spring steel. The controlled grain structure provides exceptional ductility—assuring you of simple, economical fabrication.

Weirton also supplies cold-rolled spring steel that is temper rolled to produce controlled ranges of hardness and tensile strength. The desired ranges are designed to meet your specific requirements—assuring you of clean, economical blanking.

Close manufacturing control has resulted in these highly desirable qualities—unique in Weirton high carbon strip:

Accurate response to heat treatment.

Uniformity of gauge and width.

Uniform chemical and physical properties.

Exact consistency of grain structure.

Controlled decarburization limits.

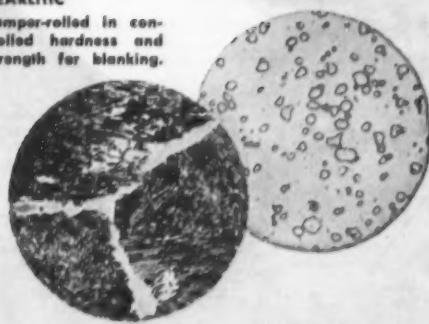
Weirton high carbon strip is available with the desired chemical analysis and for specific heat treating and hardness ranges, in widths up to seven inches.

SPHEROIDIZED

Annealed, soft and ductile
—ideal for cold forming
operations.

PEARLITIC

Temper-rolled in controlled hardness and strength for blanking.



WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



ALL NEW SELF-CONTAINED INJECTION END

ALL NEW SELF-CONTAINED CLAMP END



A NEW APPROACH
TO DIE CASTING

NEW H-P-M
DIE CASTING MACHINE
OFFERS MORE THAN JUST
NEW MACHINE DESIGN

The new H-P-M die casting machines are being hailed as the most important advancement in die casting in fifteen years, and rightly so . . . more than forty new and improved features! These features result in minimum mold flash . . . faster die set-up . . . greater versatility in die usage and casting design . . . reduced maintenance . . . maximum safety and performance. The new self-contained Link-Wedge mold clamp is the best. There's plenty of "beef" in these new models. They are available in a complete range of sizes . . . cold chamber or gooseneck types.

Write for Bulletin 5400 which describes these new units in detail.



THE HYDRAULIC PRESS MFG. COMPANY

1006 Marion Road, Mount Gilead, Ohio, U. S. A.



METAL WORKING PRESSES



PLASTICS MACHINES



Die CASTING MACHINES



C-PRESSES



POWER EQUIPMENT

PERSONNEL

Buford H. Melton, appointed contract division sales manager, Admiral Corp., Chicago.

James E. Stopford, appointed chief field engineer, Mechanical Industries, Inc., Pittsburgh.

A. J. Jermann, appointed assistant superintendent, Republic Steel Corp., Nos. 5 and 6 blast furnaces.

D. G. Gibson, appointed district manager, The Timken Roller Bearing Co., Dallas territory.

Donald J. Lewis, appointed sales representative, The Taft-Pierce Mfg. Co., Woonsocket, R. I.

OBITUARIES

Alfred A. Tickle, 62, president, Arthur Tickle Engineering Works, Brooklyn, recently, at Long Island College Hospital.

James G. Morris, vice-president, Gibson-Morris Steel Co., Birmingham.

George G. Harrington, 56, vice-president and chief engineer, Hunt Tool Co., Houston.

J. Howard Hamilton, 52, formerly commodity manager, General Sales Dept., American Can Co.

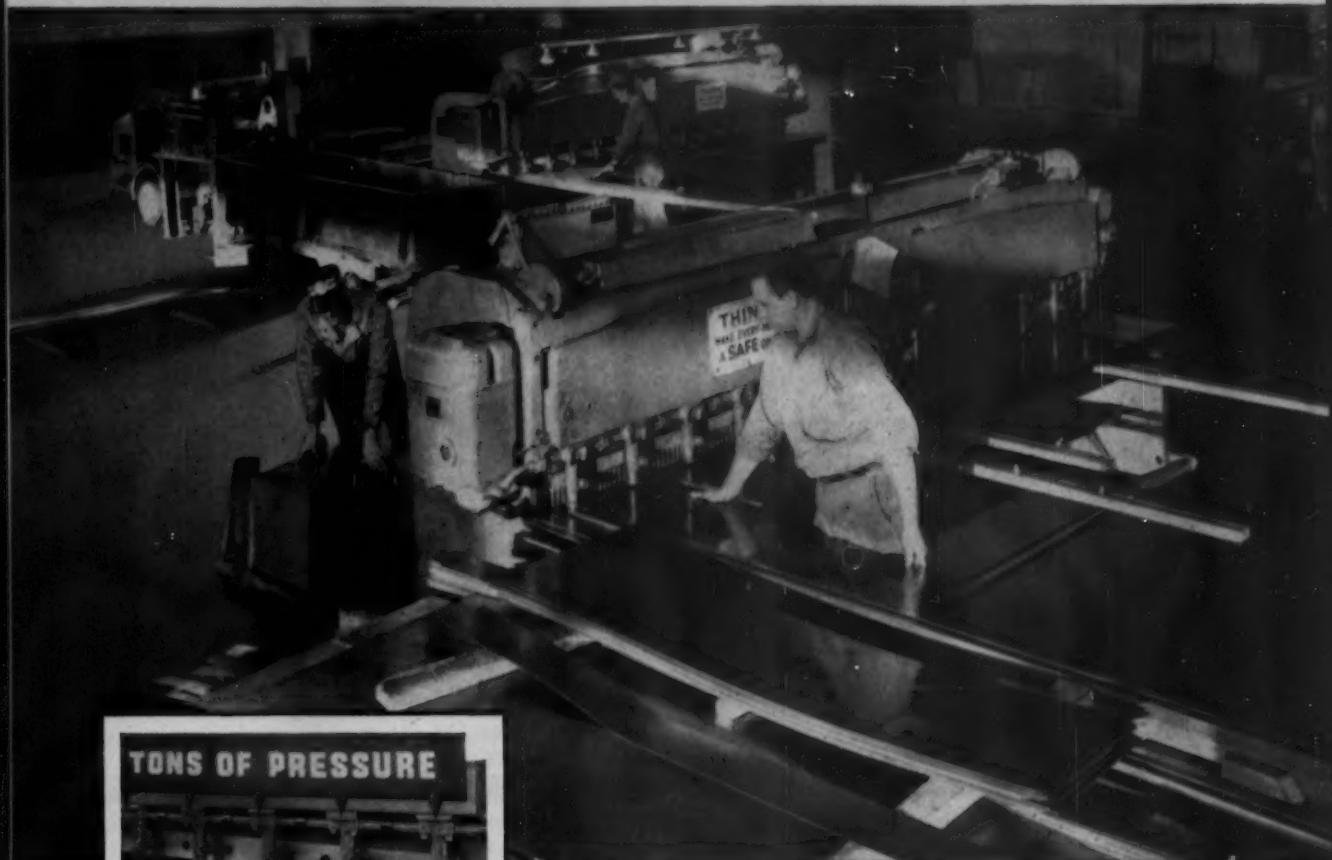
Jerald P. Moore, 61, Cleveland district manager, The Electric Controller & Mfg. Co., suddenly.

John T. Parker, 53, manager, Inland Steel Co. coal properties at Wheelwright, Ky., suddenly.

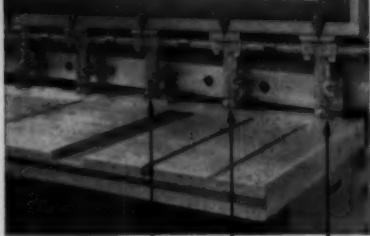
Stanley D. Gralak, 42, supervisor of stress analysis, Deere & Co., Moline, Ill., recently.

William B. Hackett, 65, Lewis Machinery Div., Blaw-Knox Co., Pittsburgh.

ACCURACY is necessary



TONS OF PRESSURE



Micrometer accuracy starts with Cincinnati Hydraulic Holddowns. They exert tons of pressure and automatically hold all thicknesses of work securely.

...AND THE SPEED AND VERSATILITY OF CINCINNATI SHEARS IS NEEDED, TOO

Here at The W. J. Holliday Company, Inc., The Department Store of Steel—these busy Cincinnati Shears operating continuously, shear accurate blanks to customer size.

They handle cold finished, or pickled and oiled sheets up to 10 gauge and hot rolled sheets up to $\frac{1}{4}$ ". Both management and operators are enthusiastic about their Cincinnati Shears.

Write for Shear Catalog S-6.

Photos courtesy The W. J. Holliday Company, Inc., Indianapolis, Indiana

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES

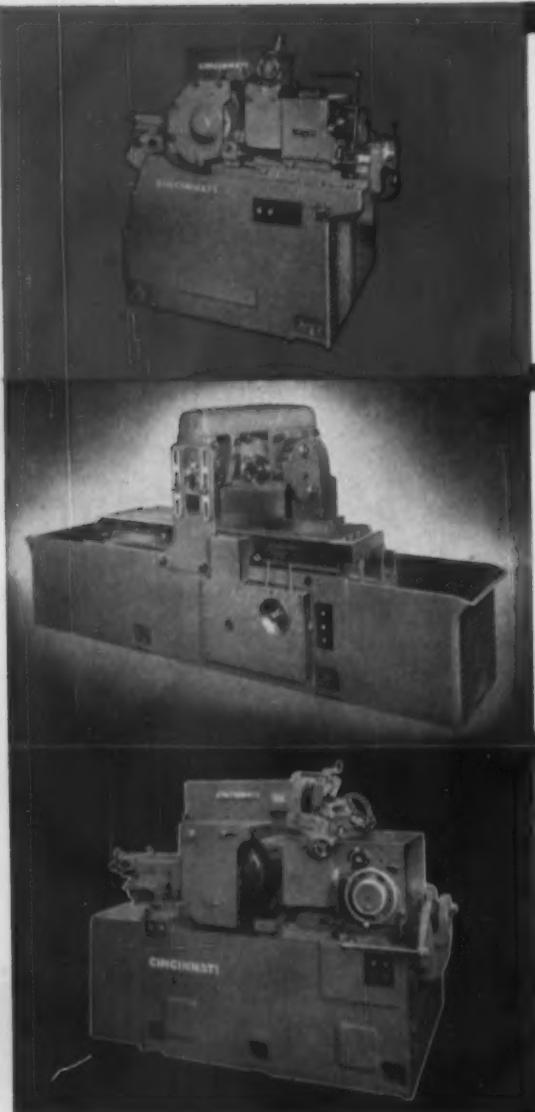


5 brand-new



There's more than meets the eye in these new Cincinnatis... they're designed to give you additional opportunities to reduce metalworking costs in your shop. It will pay you to get the facts on the new Cincinnatis that fit your type of product. Write for literature . . . no obligation.

The Cincinnati Milling Machine Co., Cincinnati Grinders Incorporated, Cincinnati 9, Ohio.



New CINCINNATI FILMATIC No. 0 Centerless Grinder. It incorporates new ways to reduce setup time; new ideas in producing higher quality finish; more powerful. New specification catalog No. G-640 is yours for the asking.

New CINCINNATI HyPowermatic Milling Machine. Everything new, including Hydramech Table Drive with variable feed and backlash eliminator. 42 sizes, plain and duplex styles, up to 168" travel and 50 hp spindle drive. Do you want more information? Write for catalog No. M-1871.

New CINCINNATI FILMATIC No. 2 Centerless Grinder. It's easy to imagine costs going down with these new machines in your shop. They incorporate a host of exclusive cost-reducing features, including anti-friction infeed slide. You will find complete data in catalog No. G-644.

Cincinnatis --- for '55



New CINCINNATI No. 1 Toolmaster Milling Machine. A new member of the Cincinnati line. Gives you a new conception of rugged construction and maximum operator convenience for light milling operations. Desired by toolmakers everywhere. Catalog No. M-1870-1



New CINCINNATI No. 1 Cutter and Tool Grinder. A fitting companion for the famous CINCINNATI No. 2 Machine. Incorporates many new ideas and features of versatility for quickly and accurately sharpening cutters of all types. You'll want to know more about this one. Write for catalog No. M-1852.

CINCINNATI

OLD IN EXPERIENCE . . .

**NEW IN PRODUCTS, PLANT, AND WAYS TO PERFORM
METALWORKING OPERATIONS AT A LOWER COST**

DATA
SHEET
NO. 1

INLAND

facts about

*Patented Tradename
of Inland Steel Company,
leaders in development
of Leaded Steels.

LEDLOY*

ONLY LEDLOY STEELS PROVIDE 25-50% FASTER MACHINABILITY WITHOUT AFFECTING OPEN HEARTH MECHANICAL AND METALLURGICAL PROPERTIES!

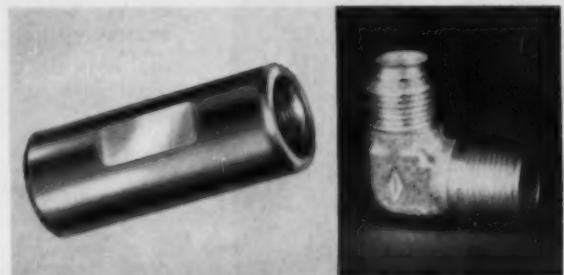
Manufacturers of screw machine products and producers of machined forgings report phenomenal increases in production and improved product appearance with the use of LEDLOY.

Screw machine operators and producers of machined forgings, all over the world, are setting new production records with Ledloy, both in the hot rolled and cold drawn forms.

The addition of lead to steel, by Inland's patented process, lowers the steel's friction component, actually lubricating the cutting tool during machining, both where the cutting edge contacts the work and where the chip bears against the tool face. Also, because of the fine lead particles throughout, Ledloy chips break up into more desirable shorter lengths which quickly fall clear of the tool, again reducing friction during cutting. Ledloy's lubricating and better-chip-forming qualities make it the fastest machining steel in the world. These qualities reduce the generation of heat, minimize the power required to cut and deform the chip and allow higher machining speeds with a correspondingly large number of parts per hour.

Yet, LEDLOY does not alter the inherent open hearth steel qualities!

Unlike sulphur and phosphorous additions, the adding of lead to steel does not affect such desirable open



Machining this coupling from cold drawn Ledloy Grade A resulted in a 50% increase in production. Tapping output doubled; taps lasted 35% longer.

A switch to hot rolled Ledloy Grade A in these forged fittings permitted a 27% increase in machinability.

hearth qualities as ductility, impact values, transverse strength, cross sectional soundness and heat treating properties. This means that both manufacturers of screw machine products and producers of machined forgings, if they use Ledloy, can realize phenomenal increases in machinability and still retain all the desirable mechanical and metallurgical qualities of open hearth steel.



If your product requires machining, it will pay you to get all the facts on Inland Ledloy. Ask your cold-drawer about it today, or write Inland Steel Company for an interesting new booklet, "Properties of Inland Ledloy Steels."

world's most machinable steel!

LEDLOY



INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Louis • Davenport • Kansas City • St. Louis • Indianapolis • Detroit • New York



DIPPING SMALL PARTS in a solution of hydrogen peroxide gives cadmium surfaces bright finish.

SPECIMENS show effectiveness of peroxide treatment. Hot-rolled steel is (1) untreated, (2) peroxide bright dipped, and (3) pickled with sulphuric acid and bright dipped.

♦ Use of peroxygen compounds is often a necessity, and in many cases offers definite advantages, in applying surface treatments to various metals . . . Hydrogen peroxide, for example, increases intensity and adherence of black finishes on zinc and cadmium.

♦ Ammonium hydroxide and hydrogen peroxide improve electrical characteristics of cuprous oxide surfaces . . . Peroxygen compounds are highly useful in etching, and perform important functions in brightening and passivation treatments.

By P. H. MARGULIES,
Director of Technical Information, Becco Chemical Div.,
Food Machinery and Chemical Corp., Buffalo

PEROXYGEN Compounds

Hold Important Place in Treating Metal Surfaces

♦ MANY surface treatments applied to metals involve the use of solutions containing oxidizing agents—mainly chromates or nitrates and the corresponding acids. In many other cases, use of peroxygen compounds offers advantages or is a necessity. These include hydrogen peroxide, compounds forming hydrogen peroxide in solution, persulphates and peracids.

Treatment of metal surfaces with oxidizing agents can be grouped, although roughly, accord-



MICROGRAPHS of steel show unfinished specimen (left) and specimen treated by Marshall procedure. White spots correspond to surface irregularities which reflect side lighting.

ing to the desired result. One type produces an oxide film on the metal surface proper. A second type removes undesirable components from the metal surface. Somewhat overlapping this is a third type of treatment which dissolves and removes metal from the surface. Oxidizing agents also keep constituents of certain treating solutions in the proper state of oxidation.

Peroxygen compounds are of actual or potential usefulness in all four types of treatments. Staining and passivating procedures are examples for the first type of treatments. A typical staining treatment is "browning" or burnishing for producing a brown to black finish on iron and steel. It is a simple and economical way to obtain a relatively rust-resistant finish and to improve appearance.

Peroxides improve finishes

The staining treatment is generally carried out by immersing the pieces in a hot strongly alkaline solution containing an oxidizing agent. Sodium hydroxide is the alkali commonly used, and a variety of oxidizing agents have been recommended. Among these are sodium peroxide or its equivalent, hydrogen peroxide. One recommended solution contains 300 to 400 g of sodium hydroxide per liter and 50 to 100 g of sodium peroxide.

A highly durable black finish for zinc and cadmium consists of a strongly adherent film of fine-grained copper oxide. The article to be treated is first immersed for a few seconds in a bath containing a soluble copper salt and a chlorate such as potassium chlorate. In a second step, the article is treated with a hydrogen per-

oxide solution which increases both the blackness and adherence of the finish. Treatment with a permanganate may preferably be applied between steps. The three steps are repeated about ten times, each step consisting of about a 10-second dip, followed by a draining period of a few seconds. This finish can also be applied to other base metals after zinc or cadmium plating.

In one method of improving the electrical characteristics of cuprous oxide surfaces in rectifiers, surface components are removed by oxidation. The copper is first oxidized so that it leaves, adjacent to the copper, a layer of cuprous oxide superimposed by a layer of cupric oxide. The cupric oxide is removed by acid etching and the resulting oxide surface is then treated for a few minutes with a solution of equal parts of ammonium hydroxide and hydrogen peroxide.

Another copper cleaning process is one in which an oxidizing agent oxidizes relatively insoluble cuprous oxide to more soluble cupric oxide. Its slight corrosive effect further promotes cleaning by flaking off insoluble foreign matter. The cleaning solution claimed to be particularly efficient is an aqueous solution containing 5 parts of sulphuric acid, 4 to 5 parts of 30 pct hydrogen peroxide and 3 parts of acetic acid in about 87 parts of water.

A solution useful for cleaning tin, zinc and aluminum surfaces without etching or discoloring consists of 63 parts of trisodium phosphate, 25 parts of sodium silicate of low alkali ratio, 2 parts of magnesium sulphate and 10 parts of sodium perborate. For sodium perborate, other hydrogen peroxide addition compounds compatible with the rest of the mixture could be

Hydrogen peroxide helps to control solutions used for phosphatizing iron and steel . . .

substituted. The cleaner is used in aqueous solution of optional concentration.

The principal purpose of etching and stripping is to remove all or part of a metal surface or layer. Use of hydrogen peroxide is well established for etching metallurgical specimens; persulphates are also used. Alkaline hydrogen peroxide solutions are used for etching carbides, nitrides and tungstides. In macroetching of iron and steel, ammonium persulphate solutions help to show details of metal structure. Hydrogen peroxide and ammonium persulphate are also used for etching copper and its alloys.

The "bright-dip" processes are related to etching and stripping procedures. They brighten a metal surface by chemically removing high spots and other surface irregularities, and help to remove surface contaminants. Here again, peroxygen compounds are useful.

An example of the fourth type of treatment in which oxidizing agents keep the constituents of certain treating solutions in the proper state of oxidation is the use of hydrogen peroxide to control the chemical composition of solutions used in phosphatizing iron and steel.

Iron and steel articles are frequently protected against corrosion by applying a phosphate coating, more particularly a zinc phosphate coating. However, a ferrous article in contact with phosphoric acid will soon react with the acid to form ferrous phosphate with simultaneous liberation of hydrogen.

The coating bath is preferably kept close to pH 3. Therefore, the ferrous phosphate will remain in solution unless oxidized to ferric phosphate, which, being insoluble above approximately pH 2, will precipitate out and can then be removed with the sludge or by filtration. Interference of soluble ferrous phosphate with the desired zinc phosphate coating can be prevented without introducing foreign ions into the bath by hydrogen peroxide oxidation of the ferrous to ferric phosphate.

The amount of hydrogen peroxide to be used is critical and depends on the particular treating bath used. Satisfactory coatings require, for example, a phosphoric acid solution with zinc content of about 0.25 pct and not less than 0.1 pct nor more than 0.5 pct, with hydrogen peroxide in amounts between 0.004 and 0.024 pct, and containing enough sodium hydroxide to obtain a pH of about 3. The treatment is carried out at below 130°F.

Bright dip aids stain resistance

Hydrogen peroxide in acid solution is an efficient brightening agent for zinc and cadmium surfaces, which are also made more stain-resistant by such treatment. In one bright dip treatment, consisting of a hydrogen peroxide solution acidified with sulphuric acid, pH control of the bath is very important. A recommended bath contains in water solution 4 pct hydrogen peroxide and 0.25 pct sulphuric acid by weight. It is applied by immersing the article for about 15 seconds, followed by a water rinse.

Another bright dip for zinc employs a solution containing 2 to 5 pct by weight of hydrogen peroxide together with either 2 to 5 pct of sulphuric acid or 2 to 4 oz per gal of sodium cyanide.

Brightening and passivation of cadmium by

Bright Dip Treatments for Steel

Water	1000 ml
Cresol disulfonic acid	25 g
Hydrogen peroxide, 30 pct	100 ml
Water	850 ml
Sulphuric acid ($d=1.84$)	150 ml
Hydrogen peroxide, 30 pct	400 ml
Water	1000 ml
Acid of potassium oxalate	150 g
Sodium perborate	100 g

Typical Stripping Solutions Containing Peroxygen Compounds

Brass from steel	Ammonium persulphate	75 g
	Ammonium hydroxide	335 ml
	Water	665 ml
Gold from copper, nickel and iron or their alloys	Sodium cyanide	2 oz
	Water	1 pt
	Hydrogen peroxide	1/2 oz
Lead from copper alloys and steel	Glacial acetic acid	1 vol
	Hydrogen peroxide, 5 pct	1 vol
	Water	3 vol
Lead from silver	Glacial acetic acid	95 pct by vol
	Hydrogen peroxide, 30 pct	5 pct by vol

means of acidic solutions of hydrogen peroxide can be accomplished with a solution containing hydrogen peroxide and sulphuric acid in specified ratio. The proper ratio of 4:1 is more important than chemical concentration. Potassium persulphate may be used instead of sulphuric acid. In such a bright dip, use of a peracid might bring certain advantages.

Another bright dip for cadmium employs a solution containing 6 oz of hydrogen peroxide 30 pet and 1 oz of concentrated sulphuric acid per gallon of water, or more generally a solution containing hydrogen peroxide and sulphuric acid in the ratio of about 1.6:1.

Marshall procedure effective

A typical bright dip treatment for steel pickles or removes rust in such a manner that the exposed metal surface is left light and shiny. It eliminates the need for mechanical finishing to improve surface appearance. It is an acid pickling process, using acids such as sulphuric, phosphoric and others. Addition of a peroxygen compound to the pickling acid accounts for the satisfactory appearance of the surface directly after pickling.

Another highly efficient and economical steel bright dip is the Marshall procedure. A suitable solution contains:

Oxalic acid (crystals)	2.5 g per 100 ml
Hydrogen peroxide, 100%	1.3 g per 100 ml
Sulphuric acid	0.01 g per 100 ml

Its rate of attack on mild steel is about 0.4×10^{-5} in. per hour at room temperature. Complete smoothing of ground textures of 40 and 20 microinches has not been achieved, but finer textures may be completely smoothed.

Ordinary solvent degreasing of steel, prior to the Marshall procedure, usually suffices. On small hardware items, such as screws and bolts, a very pleasing appearance is secured by solvent degreasing, followed by the dip. Prompt rinsing with water and drying are essential.

In a patent by Vereinigte Aluminum Werke, a treatment for aluminum utilizes a solution containing phosphoric acid and hydrogen peroxide, either in form of a chemical or in form of an electrolytic bright dip.

The chemical bright dip is applied to aluminum or high-aluminum alloys by immersing the metal for 2 to 3 minutes in the solution which is kept at 90° to 100°C. The solution is made up by mixing 1 liter of phosphoric acid ($d = 1.6$) with 100 ml of 30 pet hydrogen peroxide. No precleaning of the metal is said to be required and highly reflective surfaces are obtained.

Brightening of aluminum alloys (Al-Mn, Al-Mg and Al-Mg-Si) is preferably carried out electrolytically with a solution obtained by mixing 1 liter of orthophosphoric acid ($d = 1.7$) with 50 ml of 30 pet hydrogen peroxide.

The metal to be treated is made the anode. Bath current is 11 v at 1.5 amp per dm^2 . Treatment time is 5 minutes at room temperature.

Aluminum-copper-magnesium alloys are treated in the same electrolyte at 4 v and 10 to 12 amp per dm^2 at 70° to 80°C.

A similar chemical bright dip for aluminum and aluminum alloys of low silicon content is one in which the aluminum articles, after solvent cleaning, are immersed for $\frac{1}{4}$ to 5 minutes in a solution kept at about 90°C. It contains 75 pet phosphoric acid, 3.5 pet hydrogen peroxide and 21.5 pet water by weight. Water content is apparently critical although a range from about 20 to 25 pet by weight seems permissible. The treatment improves surface reflectance up to 60 pet.

Chemical brightening of brass is usually done by chromate-sulphuric acid pickling. Practically the same effects can be achieved by using an acetic acid solution of hydrogen peroxide. This solution is made up by dissolving in water 5 pet hydrogen peroxide and 5 pet glacial acetic acid. The metal is treated by immersion at room temperature for about one hour. Higher concentrations and temperatures permit shorter treating times.

Treatment with an acid solution of a persulphate gives an etched appearance to the brass surface. The solution may contain from 1 to 5 pet ammonium or potassium persulphate, with or without sulphuric acid, and is applied for about one hour at room temperature.

A phosphate and an oxidizing agent in combination can be used to inhibit corrosion of mild steel by corrosive waters. The inhibitor combination is such that the primary corrosion product is a crystalline ferric phosphate and not ferrous phosphate which is apt to prevent interaction between the metal surface and inhibitor.

Persulphate stems chlorine attack

An example of preventing corrosion of steel by means of a specific oxidizing pretreatment of the metal surface is one in which the treated steel articles show no rust formation during a 100-hour immersion in sodium chloride solution.

Steel articles were first immersed in a 2 pet solution of sodium thiosulphate containing 0.5 pet ammonium persulphate by weight of solution. Immersion was for a short time only at room temperature. The work was removed, rinsed with water and immersed in a solution of potassium dichromate containing minor amounts of sodium thiosulphate, or immersed in a solution of potassium chromate containing sodium thiosulphate and an oxidizing agent.

Although stainless steels are generally resistant to various chemical solutions, they are attacked to some extent by solutions containing active chlorine. This attack is prevented by treating the stainless steel at room or elevated temperature with a solution of a persulphate. An aqueous solution containing about 1 to 2 g of potassium persulphate per liter is used for 8 to 48 hours at room temperature, or 6 to 8 hours at temperatures between about 50° to 80°C.



WEIGHT OF TUBING is read directly from indicator set on bottom of traveling crane cab.

CRANE SCALE

Simplifies Warehouse Weighing Operation

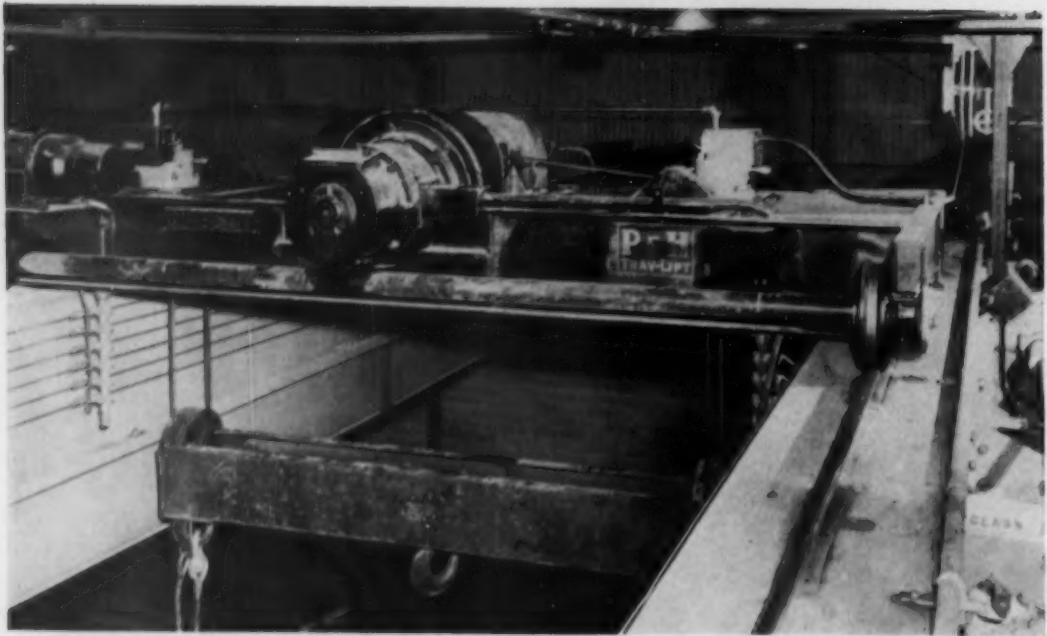
♦ A weighing crane equipped with electro-hydraulic load cells has cut costs in both the weighing and handling of tubular steel at one warehouse . . . Some operations required in mechanical weighing have been eliminated . . . Valuable floor space has been freed for more productive use and labor requirements reduced.

♦ Basic units in the load cell are the differential transformer and a pressure sensing Bourdon tube . . . These convert the mechanical force exerted by the load into proportional electric voltage which is fed into a null balance circuit in the dial indicator.

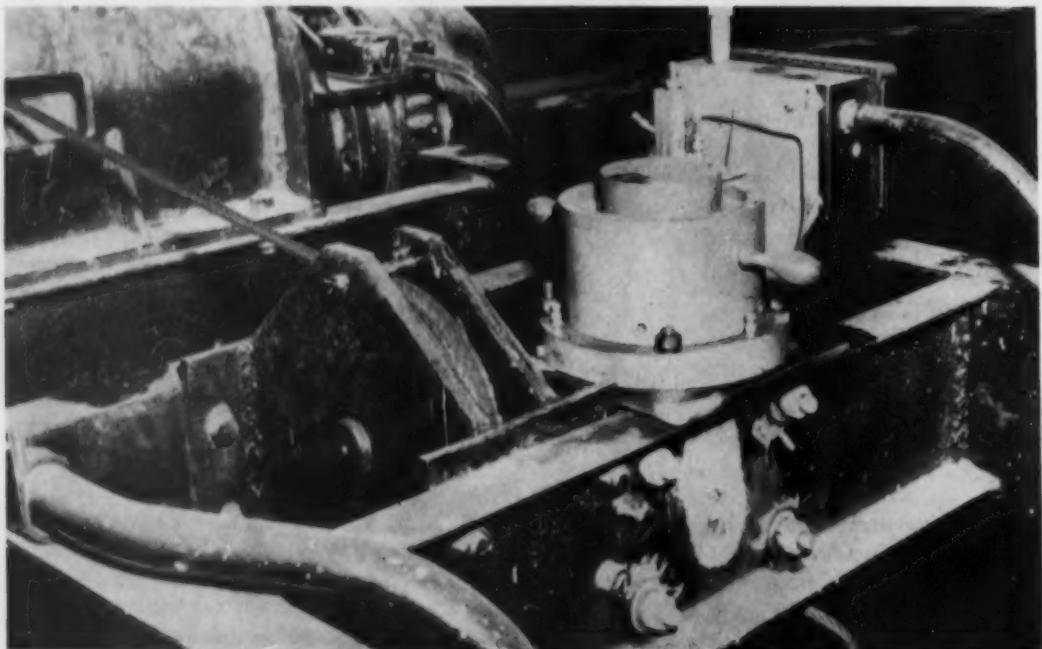
By C. E. ROESSLER, JR., Field Engineer,
Automatic Temperature Control Co., Inc.,
Philadelphia

♦ MORE EFFICIENT and more accurate weighing and handling of tubular steel in warehousing operations has been made possible through use of an electro-hydraulic crane scale at SKF Industries, Inc., Philadelphia, bearing manufacturers.

A differential transformer is used in connection with hydraulic load cells in the weighing crane to convert a mechanical force (in this case the material weighed), to a proportional electrical signal. This signal is used in indicating the weight of material on the crane. Load cells for the crane were built by Automatic Temperature Control Co., Inc. of Philadelphia. Use of the weighing crane has eliminated weighing on mechanical scales, eliminated scale



THIS TRAVELING crane scale, equipped with Alco-tran units, has simplified weighing operations.



LOAD CELL MOUNTING arrangement as used on the P & H weighing crane at SKF Industries, Inc.

maintenance problems, and permitted better utilization of warehouse space.

Problem at the SKF plant was to keep a continuous inventory of the amount of steel received and stored in their warehouse and the amount of steel released to production. Previ-

ously an overhead crane lifted a batch of material and placed it on a large capacity mechanical scale. Weight was noted and the material placed in stock or released to production. This method required a crane operator, a weigher, two warehousemen for loading, a tedious hand weighing

A crane operator and two warehousemen now handle the complete operation . . .

operation and two separate bundling operations, both on and off the mechanical scale.

The new method using a differential transformer weighing system requires the services of only a crane operator and two warehousemen. It eliminates one lifting operation and the time-consuming hand weighing operation. This was accomplished by applying the basic differential transformer to a simple Bourdon tube pressure element and attaching this combination to a large capacity hydraulic load cell.

The hydraulic load cell converts the force applied to its operating piston into a proportional hydraulic pressure. This is achieved by an unusual design of a rigid cylinder, containing a small volume of oil and a movable constant area piston which is floated by the oil.

As pressure is applied to the piston, the oil opposes this force with an equal internal pressure. The Bourdon tube element, being connected directly to the closed oil supply is also pressurized and responds to each change in the oil pressure. (NB: Hydraulic oil is in a "closed" system from the load cell to the Bourdon tube. Total volume of oil in the system is about $\frac{3}{4}$ -cu in.).

When the motion of the Bourdon tube actuates

the armature of the differential transformer an electrical signal is induced having an amplitude proportional to the oil pressure and hence the load applied to the hydraulic cell.

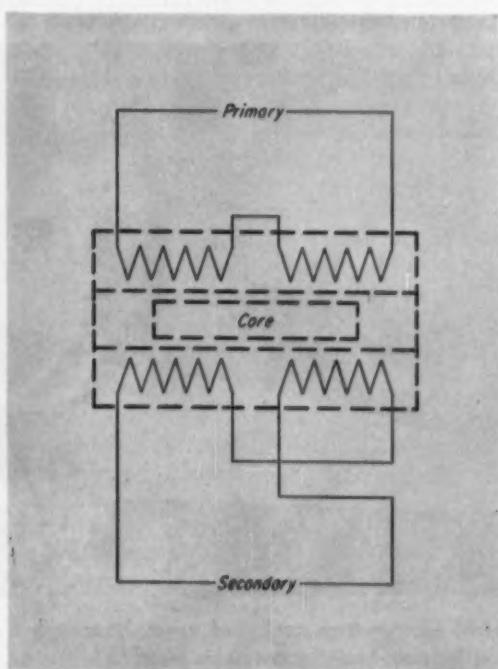
In this installation, two such load cell assemblies comprise a complete load sensing device. Each cell supports one cable on a 4-cable system or each cell will sense one-fourth the total weight of the system. In order to tare out the weight of the scale components such as the cable, beams, sling chains and hooks, the differential transformers are adjusted to give a zero output with these units attached and any additional load will result in an electrical signal output. This system results in a scale having a live zero condition at all times.

Total signal fed to receiver

To obtain the total weight supported by the scale, the output voltages of the two cells are placed in series, so that the signals are additive. The total signal is then fed to a receiver in the cab of the crane. The receiver and load cells comprise a null-balance type system. It may be a visual indicator which would require the operator to record the values in a log book or it may be an automatic servo driven printer which would record the batches of material on a continuous tape or a punch card.

This system eliminated one man from a 4-man crew, a shackling operation, a hand weighing operation that required three men to stand idle while the weighing was done.

The Differential Transformer



◆ Primary element in the electronic system of the crane scale is the differential transformer. It consists of two primary windings connected in a series aiding relationship and two electrically balanced secondary windings connected 180° out of phase in a series bucking relationship. A small iron core is the controlling factor of the transducer's output signal.

All coils are wound on a single ceramic bobbin. When the primary winding is energized by a small alternating current, about 3v, with the armature in the electrical center of the coil, flux linkages about each secondary winding are identical. This results in an equal potential being induced into each secondary coil and the voltages induced cancel each other.

When the armature is moved from this neutral position, a greater signal is induced in one of the secondary windings and a correspondingly reduced signal will result in the other secondary winding. The difference between the induced potentials in the two secondary windings is the resultant output signal of the transformer.

Teamwork essential—

Outside Facilities Lower Plant Heat Treating Costs

By E. M. OLSON, Supt. of Assembly,
Pittsburgh Equitable Meter Div.,
Rockwell Mfg. Co., Pittsburgh

• REGULAR USE of outside heat-treating facilities can mean important savings for the manufacturer whose volume of parts requiring special heat treatment is not enough to justify the cost of keeping furnace temperatures up constantly—or who faces the problem of having to add extra equipment as his heat-treating requirements expand.

Careful selection of a properly equipped and properly manned heat-treating shop and a high degree of teamwork between shop and manufacturer are major requirements for a successful arrangement of this sort.

If these conditions are met, the manufacturer

• Where the volume of parts requiring special heat treatments is not enough to justify the cost, important saving can be made through the use of outside facilities . . . They can also be used to advantage in handling sharply expanded output.

• Careful selection of a properly equipped plant and close teamwork between the outside plant and the manufacturer are essential . . . Procedures for handling, packaging, parts identification and production scheduling must be established.

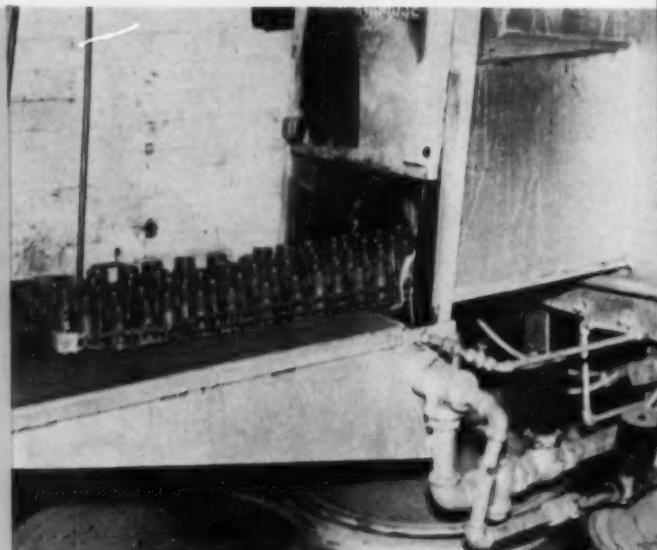
may find it advantageous to continue the arrangement even after his volume increases. Free metallurgical service and adequate equipment to meet special finishing needs are two important advantages offered by high-grade metal treating firms.

At Rockwell Mfg. Co.'s Pittsburgh Equitable Meter Div., savings of about 25 pct have been achieved by the use of an outside shop for treating steel gears, shafts and bearing parts for Rotocycle gasoline, oil and industrial meters.

Results have been so satisfactory that the company is now also using this outside source exclusively for heat treating production tools.



HEAT TREATING low-carbon steel control gears in salt bath at outside heat-treating plant.



GEARS emerge from controlled atmosphere hardening furnace. Material is 430 stainless.



MEASURING machine checks pitch diameter of gear for distortion after heat treatment.

High-quality heat treating is essential for Rotocycle parts, which must be able to resist the effects of erosion and heavy wear caused by passage through the meter of all sorts of liquids at rates of flow of up to several thousand gallons a minute.

Formerly these parts were heat treated in a salt bath furnace at the plant. This proved to be too expensive since furnace temperatures had to be maintained level throughout each week to prevent dissolution of the salt bath—even though there were not enough parts running through to justify operating the furnace more than two or three days a week.

The decision to use outside heat-treating facilities was brought about by a series of design and specification changes in Rotocycle parts, making it necessary to heat treat a wide variety of SAE steels. To do this work with in-plant facilities would have involved the purchase of considerable equipment, more plant space, higher maintenance costs and additional experienced labor.

Check plant facilities

Drawings and samples of parts were submitted to the various concerns. The samples were treated and returned for checking and approval by the company's inspection department for quality and test. Also, cost statements on heat treating each item were submitted to the accounting department for comparison with plant estimates of what the price should be.

On the basis of comparative costs and tests, the Pittsburgh Commercial Heat Treating Co.

was tentatively selected. Representatives from the assembly and purchasing departments toured this heat-treating plant to make a close study of its facilities and procedures.

The company was found to be equipped to handle all heat-treating assignments of the Pittsburgh Equitable Meter Div. including hardening of all types of SAE steels and annealing and stress relieving of castings.

Another important consideration in the selection of this firm was that it is also equipped to handle plating work. This eliminated time and handling costs involved in sending heat-treated work to another company for plating as was done formerly.

Standardize procedures

To carry out this arrangement with greatest efficiency, standard procedures for handling parts, proper packaging and parts identification, transportation and production scheduling were made.

Except for the smallest pieces, which are charged on a per pound basis, all charges are made on a per item basis. To simplify handling, all except the smallest item sent out for heat treating are packaged in self-counting boxes and containers.

In addition to being listed in order, each piece or container is properly marked or tagged to identify it and to indicate the type of metal used and work to be done.

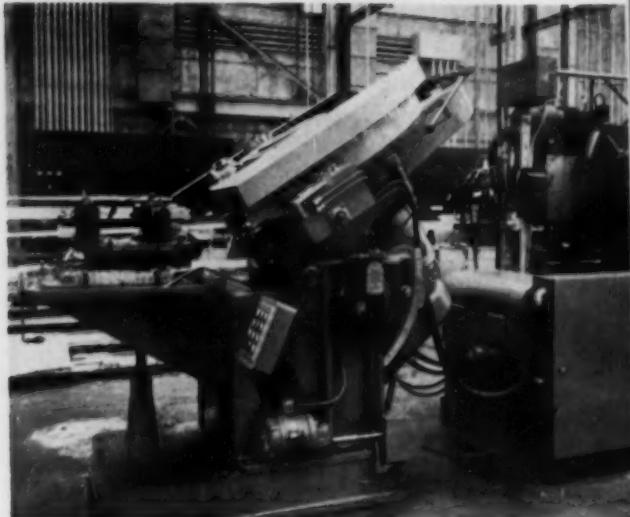
Schedule 90-day supply

The work is delivered to the shop and picked up the following day. This 24-hour schedule simplifies production scheduling. Even quicker service is given on emergency orders, which are delivered in the morning and picked up in the afternoon of the same day. Packaging is supervised by the inspection department to avoid any possibility of nicks or distortion in pieces being sent out for treatment. Maximum efficiency is gained by scheduling runs on the basis of a 90-day supply of each item.

Plating of heat-treated parts is handled by the same heat-treating company. This obviously saves making up separate orders for plating work and time and effort in extra handling. Another advantage of this outside heat-treating and plating facility is the availability of additional finishing equipment.

Naturally the materials flow pattern between the two plants is complicated by the necessity of plating certain items before machining is completed. This is particularly true in the case of copper-plating Rotocycle gears before final machining of the unplated teeth. The copper plating, in this case, is applied primarily to prevent hardening of the rest of the gear, which would prevent it from being drilled, peened into position in the ball clutch, and so on.

For compound angles—



OPERATOR'S side shows control panel, tilt-head feed and indexing unit, hydraulic power unit.

Tilt-Turret Machine Cuts Tool Changing and Setup Time

By L. M. HUTCHISON,
Supervisor of Plant Engineering and Design,
Douglas Aircraft Co., Long Beach Div.,
Long Beach, Calif.

- Eight successive compound-angle machining operations on an unwieldy part posed some problems for Douglas Aircraft Co. engineers . . . Standard machine tools involved too many cutter changes or fixture setups . . .
- A new machine with eight tool spindles on a tilting turret was designed to do the job . . . Parts are now completed in 50 pct less time than standard tools would have permitted.

• A SPECIAL MACHINE TOOL with an 8-spindle tilting turret has cut floor-to-floor time approximately 50 pct in machining compound angles on airplane wing-tank stringers. Standard machine tools available at Douglas Aircraft Co.'s Long Beach (Calif.) Div. were not adaptable to the eight angular operations required.

Main wing-tank stringers are long spar-cap type parts which are bolted to a bulkhead just inboard of the wing gas tanks. They are riveted to the wing skin and follow the converging contour lines to the outboard wing tips. Each upper and lower stringer requires eight separate machining operations on its tie or "glob" end, including a face cut to the angle at which it joins the bulkhead. Angle of the hole and counterbore in these tie ends is normal to the face cut.

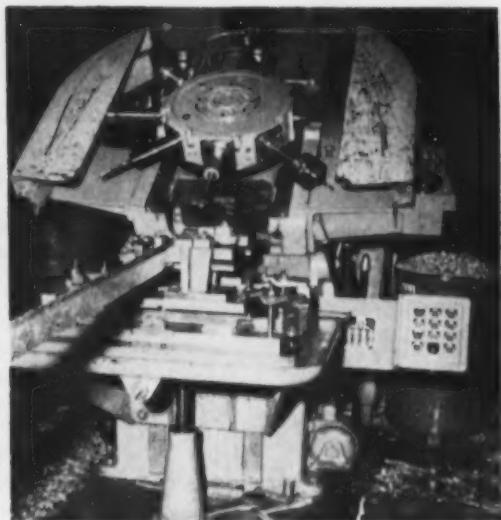
Since all stringer ends have a different compound angle, each had to be machined in a separate setup. The ends are designed so that the following operations have to be performed: (1) center drill, (2) face end, (3) core drill, (4) back counterbore, (5) finish bore, (6) rough cone cut, (7) second rough cone cut, (8) finish cone cut.

To do all eight operations on any available machine tool would mean either (1) changing cutters after each operation while the part remained clamped in the fixture, or (2) changing the part and fixture setup after each operation.

With either of these methods many hours would have been lost through tool changing or extra part handling. Also the available milling machine, without hand quill feed, did not have cutter feed normal to the cutter. The only way



STRINGER in position at start of drilling operation.
Drilling and setup take 1½ min.



TURRET properly tilted and stringer positioned for start of back counterbore operations.

to obtain this feed was to set the cutter in a vertical position and raise the table. This was considered impractical since a 30-ft long stringer had to be supported at the outer end.

Another alternative was to set the cutter horizontal and feed the table across. But with both of these methods it would have required setting the part at an angle and elevating the outer end. This was also impractical because of part length.

The decision was finally reached that a machine might be built to do all eight operations without changing either the cutting tools or the part setup for each operation.

A large 8-spindle Burgmaster turret machine was finally chosen to do the job. Its spindle could accommodate eight separate cutters. But the compound angle of the stringer ends could not be handled with the machine's cutters feeding from a standard vertical position.

Solve compound angle problem

It was thought that this problem could be solved by laying the stringer in a fixture, rotating it to one of the compound angles, and then tilting the turret head to feed the cutters from the other angle.

The problem was proposed to the Burg Tool Mfg. Co. The firm suggested redesigning and building a machine whose turret would swivel to any angle up to 45° from the horizontal. Preliminary drawings were made and the unit was quickly built and delivered to Douglas.

After checking out the machine it was decided to handle the cone cut by separate setup after

the other operations. The new equipment has been very satisfactory. Over-all time saving is approximately 50 pct compared to a standard machine, figuring setup and cutting time. Present floor-to-floor time is 16 minutes to completely finish a stringer.

Original redesign of these aircraft stringers was prompted by the necessity and desire to assemble planes with fewer and stronger structural components. This would have been done despite the extra machining problems, but the new machine has solved these.



CONE cutters have just completed final operation.
Stringer still clamped in position.

Improve Mold Feeding Systems to Cut Casting Scrap

By W. M. HALLIDAY, Consultant, Southport, England

- ◆ Proper design of runners, feeders and gating systems can go a long way toward cutting down foundry scrap resulting from sand, slag and dross picked up in the molten charge on its way to the mold.
- ◆ Simple standard wooden or metal patterns for molding feeding elements to correct size and shape permit better control over the casting operation . . . Runners and gates should be located to insure minimum variations in metal temperature.

◆ SUCCESSFUL and economical sand-mold casting depends largely on efficient feeding of the mold, as embodied in the pouring, runner and gating systems employed. Most foundrymen allow for a loss, by scrap and faulty parts, of 5 to 8 pct of total tonnage produced. While much of this metal is recovered by remelting, there is a considerable loss of metal, time, labor and processing materials.

Much of this scrap-loss occurs as a result of "inclusions" of sand, slag and dross picked up in the molten charge as it passes through the mold. An estimated 80 pct of such scrap could be averted by the use of correctly-designed, properly located and well-finished pouring basins and runner gate channels in the mold. Additional scrap arising from unequalized shrinkage warp-

age, distortion, and cracking could be avoided by the use of proper mold feeding systems.

Clean metal is needed for charging the mold. Slag and dross accumulations which become occluded in the molten metal in the cupola, and then drawn-off into the ladle, are less likely to be carried into the mold cavity if the following points are observed:

1. The casting should be poured from the bottom wherever possible.
2. The ladle should preferably have a teapot spout to ensure smoothest admission of the charge.
3. The feeding system should, if possible, be provided with a correctly designed pouring basin, runner head or runner bush.

The two latter requirements are often over-

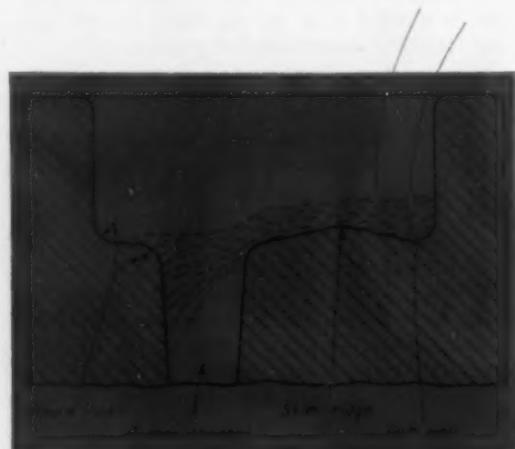


FIG. 1—Rectangular shape and vertical sides of pouring basin help reduce metal turbulence.

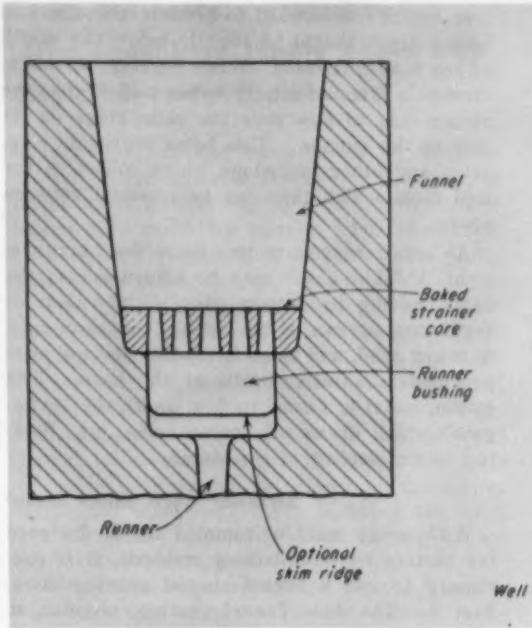


FIG. 2—Funnel shaped pouring basin is often preferred where hand ladling methods are used.

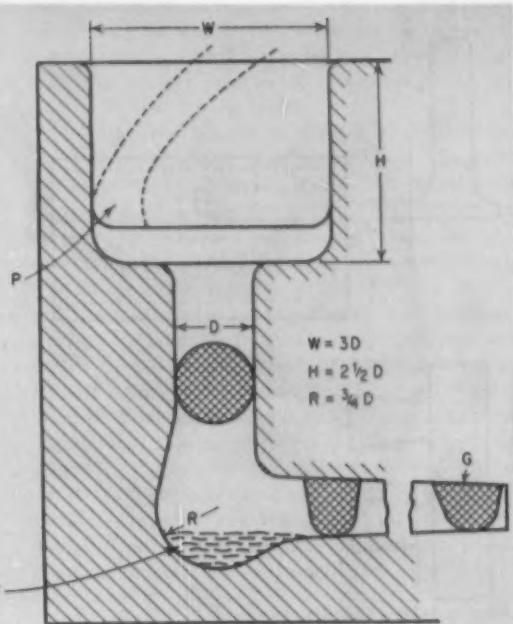


FIG. 3—When pouring, molten metal should first impinge against corner P to smother turbulence.

looked. Frequently no pouring basin is used at all, so that the molten charge is poured straight into the runner. Where basins are used, their form, shape and finish often leave much to be desired. It is often impossible for these mold elements to fulfill their functions, one of which is skimming or straining dross and slag inclusions from the incoming charge before the hot metal enters the runner.

Use standard mold feeding patterns

All molten metal admitted to the mold, must flow through the pouring basin or runner mouth, down the runner channel through the gate orifice and into the mold cavity. The metal is usually hottest and most turbulent when entering the basin and flowing through the upper regions of the runner. Surfaces of the basin, runner channel, and gate opening, are subjected to more severe heating conditions, and have greater tendencies toward erosion than surfaces of the mold cavity. Sand, slag, and dross "inclusions" which originate during the pouring stages, are difficult to segregate from the charge in its passage through the lower regions of the feed system.

Design and construction of pouring base and runner elements requires care and accuracy. Too frequently pouring-basins, etc., are quickly formed by hand, cut out with a trowel, from loosely rammed backing sands. They often have the wrong internal shape, incorrect size and a comparatively loose surface finish. As a result

loose sand particles are easily washed into the mold cavity to become occluded in the casting.

Provision of simple standard wooden or metal patterns for molding feeding elements to correct size and shape is generally justified by greater freedom from scrap. Such standard patterns assure greater control over pouring, assure cleaner metal and simplify the casting operation.

Fig. 1 shows a preferred style of pouring basin. The rectangular shape and vertical sidewalls ensure greatest freedom from turbulence; increased basin capacity and enables the molder to hold the basin full throughout pouring, thereby obtaining maximum weight of metal-head above the runner. The basin is of ample depth to obviate dross collecting above the down-runner.

Ample radii are provided at the junctions of the sidewalls and basin bottom. The runner mouth, where it breaks into the bottom of the basin, is similarly well rounded. Such portions not only induce better and smoother flow to the runner, but also reduce the danger of "inclusions" because well rounded portions such as these can be properly rammed and faced smooth for most durable working.

The runner channel is located near one end of the basin, preferably farthest away from the pouring point. The bottom surface of the basin to the right of the runner is inclined upwardly to form the "skim-ridge." The crest of the latter is higher than the mouth of the runner channel leading out of the base of the basin.

To the right of the skim-ridge the basin bot-

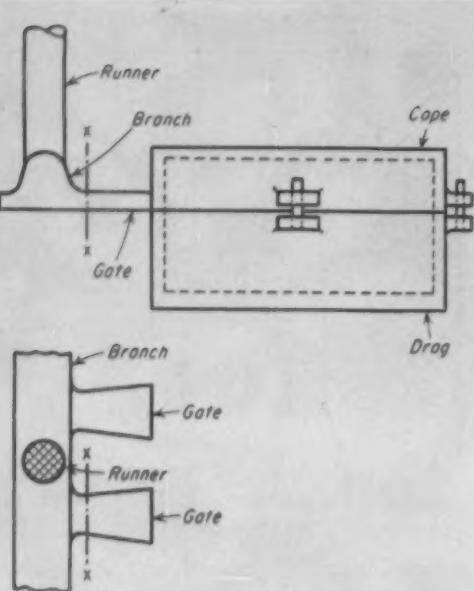


FIG. 4—Ingate should be located in upper cope section to keep dirt from entering mold cavity.

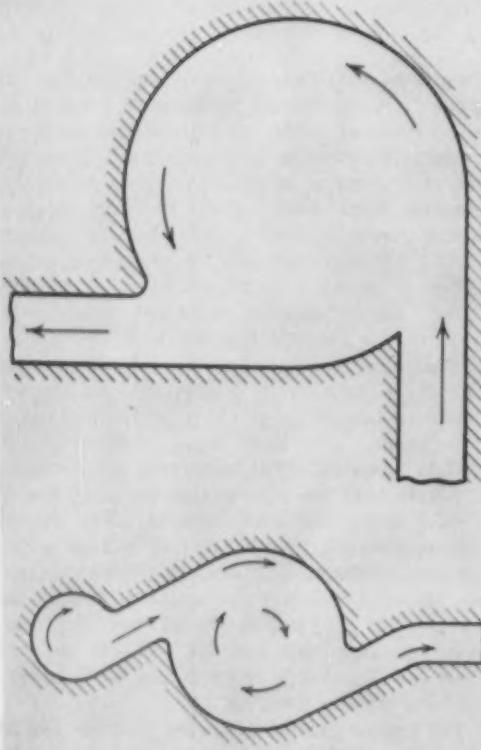


FIG. 5—Spin runners catch dirt in vortex of swirling metal. The design shown at top is recommended for good circular action. The Van Riet spinner runner, bottom, is for very light alloys.

tom inclines downward to produce the dam-well whose depth should be slightly below the mouth of the runner channel. When pouring, the metal stream is directed into this dam well so that the stream has to flow over the skim ridge on its way to the runner. This helps segregate slag, dross and other inclusions which collect in the well from which they can be removed between pours.

As an alternative to this basin floor arrangement, a "skim-gate" may be affixed across the basin, having its bottom edge slightly clear of the bottom surface of the basin. This skim-gate, in baked sand, will be pocketed into vertical slots provided in adjacent walls of the basin. The molten metal is forced to flow under the "skim-gate" which draws off drosses, slag, etc., floating on the surface of the stream.

Strainer core skims metal

With small machine-rammed molds designed for casting by hand-ladling methods, it is customary to use a funnel shaped pouring-basin, Fig. 2. The deep funnel portion, circular or rectangular, leads into the shallower runner-bush having vertical walls and amply radiused corners. Use of a skim-ridge is optional.

Skimming of the molten metal admitted into the funnel basin may be eliminated with a baked strainer core. Sides of the baked oil-sand core are tapered to suit the lower walls of the funnel. It is tightly and closely fitted into the bottom of the funnel-basin to rest on top of the bush. Tapered holes are cored in this strainer to feed metal to the bush and runner. Number and size of holes will vary with the size of casting, etc.

Pouring basins too small in relation to the runner gate system, or gates of incorrect capacity in comparison to runners may cause poor feed in the mold. Size of the basin should always be in strict proportion to runner and gate sizes.

Runners, gates and basin should be formed as part of the pattern wherever possible, so they may be rammed with prepared facing sand and finished to the same degree of firmness and smoothness as the walls of the mold cavity.

Fig. 3 shows the size proportions of mold feed elements for a simple system used in producing small brass or gun-metal castings. The rounded well at the bottom of the down runner should project below the floor of the horizontal gate by about half the radius dimension as shown.

The well reduces turbulence at the bottom of the down-runner where the stream changes direction to flow along the horizontal gate to the mold. Some molten metal remains in the well, acting as a cushion for the descending metal.

A horizontal gate usually gives greater control over the flow of metal into the mold cavity. Gate section should decrease in thickness but increase in width as it approaches the cavity.

When pouring, Fig. 3, molten metal should

Basin and runners should be large enough to supply gates with ample hot metal rapidly . . .

impinge first against basin corner P. Weight of the incoming metal smothers turbulence in metal layers already flowing over the basin floor before they reach the runner. The basin may be filled very steadily and without undue agitation of the metal.

With dry-sand molds horizontal gating is often unnecessary; and it will usually be possible to eliminate the pouring basin too, since the down runner can be adapted to deliver metal straight to the casting.

In general, the pouring basin and runners should be of sufficient size to supply the gate or gates with ample hot metal as quickly as required. Speed of supply is often the most critical factor, especially when having to use fine or restricted gates.

When total capacity of the gate or gates is less than that of the basin and runner, metal will rise unduly in the runner channel, causing a difference in level between the metal in the mold and that in the runner. This difference leads to a disparity in pressure of the two levels of metal. If the pressure difference is too great, metal entering the mold at high speed has a greater tendency to cut into surfaces of the cavity and core, and detach particles which wash along with the stream.

The rapidity with which metal enters the cavity varies. When gates have a much larger capacity than the runners, etc., feeding them, it becomes increasingly difficult to keep the feeding system filled with hot liquid metal. As a result, some portion of the cavity may be temporarily denuded of its proper supply of metal, whilst flowing conditions in the cavity may be poor and sluggish. Those portions bereft of metal may easily fill up with air, which later becomes occluded in the charge and results in "blown," porous or only partially formed waster castings.

Keep metal flow uniform

With best conditions of runner gate relationship, i.e., where the capacity of each is identical, there will be comparatively little difference in such metal levels and pressures throughout the feeding system and cavity region. Thus the rate of flow into the mold and the rapidity of filling the cavity will be steady and uniform.

Under ideal conditions, metal in the mold will solidify practically simultaneously over all portions of the casting. The latter when cooling should be free of unequalized shrinkage; as well as such common faults arising from the inclusion of air, slag, sand, dross, etc.

Runners and gates should be located to ensure minimum variations in the temperature of metal entering and within the mold. In practice, the

best approximation to ideal working conditions which may be hoped for, is to strive to ensure a progressive solidification of the metal charge, with the hottest portion of the metal being the last to be cast in the mold.

Locating the ingate so that it feeds into the thinnest or lightest wall sections of the casting provides a simple, quick and economical means for obtaining more uniform solidification of metal in the mold and giving maximum freedom from shrinkage, porosity, distortion, cracking and similar defects.

Normally plate type patterns are prepared having the ingate formed as an integral part. In all cases it is preferable to locate the ingate in the upper cope member of the mold as in Fig. 4. Dirt impurities which accidentally enter the stream passing through the basin or runner channel, have a better opportunity of rising freely to the top instead of flowing into the mold cavity. Ingates are wider but thinner at the point of entry into the mold than at the runner branch, to help reduce turbulence.

Spinner runners clean metal

Pencil type runners are chiefly used for feeding castings of simple shape and compact form, which are not materially cored. They ensure a continuing supply of liquid, hot metal to the mold, delivering it at a speed which will enable most shrinkage to be completed before the pouring ceases. The runner has to be of ample capacity, direct, and free from restrictions liable to slow down the flow. The charge must be very hot so that rapid delivery is possible.

Strainer runners are essentially an adaptation of the pencil runner. Their function is to distribute the molten charge in the most even and simple manner throughout the mold cavity areas.

Strainer runners are mainly used for feeding the bosses of flywheels, or large gears and pulleys, etc.; usually being located immediately above the center bore for direct feeding. They are capable of preventing numerous casting strains, and produce castings free from common shrinkage faults, especially in bores reproduced without the customary cores. As with pencil runners very hot metal should always be employed with strainer runners; and a considerable head of metal ensured in the pouring-basin or runner bush.

Whirl or spinner runners are used extensively on both ferrous and nonferrous castings. This style runner, by centrifugal force, causes the metal to flow in a circular path. Object of such spinning action is to obtain easier separation of solid impurities and to bring these to the surface and prevent their ingress into the mold.

Spin runners should be formed as shown at top, Fig. 5. This design creates a good measure of whirling movement. For best results, diameter of the circulating chamber should be from 4 to 5 times greater than the diameter of the largest of the inlet and outlet channels.

How to Obtain Constant Wall Thickness on Drawn Cups

With light stock—

♦ TO OBTAIN CONSTANT wall thickness on cup-shaped parts drawn from light stock, traditional stamping practice has been to provide for ironing the wall. Theory is that unless this ironing allowance is made, either the ID or the OD of the cup can be held to close tolerance, but not both.

The Worcester Pressed Steel Co., Worcester, Mass., managed to solve this traditional problem on a recent job. The work concerned a large bearing cage similar to the one shown. It involved holding the wall thickness to 0.156 in. plus 0.003 in. and minus 0.000 in., on a cup 7 in. in diameter.

Measure die deflection

Material for the job was deep-drawing SAE 1010 steel. As only a light ironing operation was involved, it seemed evident that this would not make up for any wall thickness variation resulting from the first operations.

Despite careful tooling, the first samples were out of tolerance. An annealing operation got rid of part of the out of round condition which was giving trouble. The firm then went to work on making the ID and OD wholly concentric.

First procedure was to establish a parallel relationship between the punch motion and the female die. This meant making sure the die was set level in the press, that ram play on the press was not excessive, and that the punch was

properly attached to the ram. Even these precautions did not produce work to the customer's requirements.

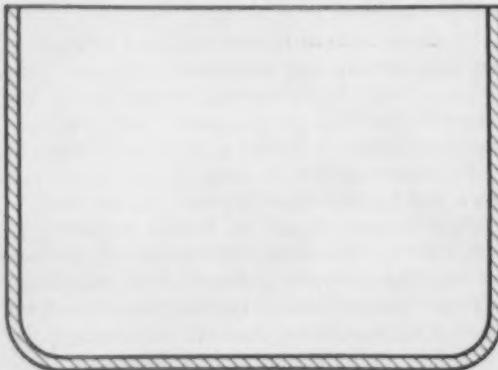
Next step was to measure deflection of the die under heavy pressure. Finding that it was bending down somewhat in the middle of the stroke, a supporting ring was called for. The die deflection had led to varying wall thickness.

Finally, the contour of the ironing ring was altered from the conventional ironing practice of using a sharp angle to the working surface of the die. This provided for a more gradual pressure application and, with a heavy shoe backing the die, seemed to hold the cup OD constant during the ironing operation. The cup nest also came in for attention.

Several thousand cups of this type have now been fabricated which fully meet the customer's requirements. The fact that, despite all possible precautions, wall thickness occasionally varies more than the permissible limits indicates that the tolerance is near a practical minimum. Also, there are bound to be variations in the gage of material used, etc.

The ironing operation is done on a 300 ton hydraulic press which is over-powered for the job under ordinary conditions. This is an added factor, since the press presumably has less deflection than a lighter one. Various lubricants did not seem to affect the problem of obtaining constant wall thickness.

Contour of Typical Drawn Cup



TO PRODUCE A CONSTANT WALL THICKNESS

1. Variations from early operations must not be too great for the final operation to remedy.
2. Equipment must be in top notch working order.
3. Punch and die should be carefully aligned.
4. Use extra heavy die construction to give adequate backup in the shoe, and avoid deflection under heavy pressure.
5. Ironing pressure should be applied gradually.

ILLINOIS GEARS ...

made right sold right

ILLINOIS GEARS are made right—our plants are equipped with the finest machine tools, plus precision inspection and quality control facilities. Our gears are made to your specifications with careful attention to materials, heat treatment and tolerances.

ILLINOIS GEARS are sold right—sales are controlled directly from our main offices and works. All ILLINOIS GEAR salesmen are gear specialists with many years of experience in the specification and manufacture of gears of all types. We sell but one product—quality gears.

If you want gears that are made right and sold right—if you demand only the best—if you countenance no compromise with quality—call ILLINOIS GEAR & MACHINE COMPANY.

Look for this mark  —it's the symbol on fine gears.

Gears for Every Purpose ... one gear or 10,000 or more

ILLINOIS GEAR & MACHINE COMPANY

3108 NORTH HATCHET AVENUE • CHICAGO 33, ILLINOIS



New Technical Literature:

Catalogues and Bulletins

Grating

The Dravo line of Tri-Lok Interlocked and Tri-Forges Welded grating and stair treads is covered in this new bulletin. The booklet explains important construction features of the two types. The styles available and typical installations and applications are shown. Information on serrated grating, armoring and flooring is also included. Tables give the grating weights, standard sizes of stair treads, panel widths, and the safe bearing loads for various bearing-bar spacings. Complete specifications are included. *Dravo Corp.*

For free copy circle No. 1 on postcard, p. 93.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 93.

Facilities

"A List of Machine Tool Facilities for Special Products" is the title of this new catalog. The catalog lists the company's machine tools and other metal fabricating, form-

ing, treating and processing equipment which is now available for contract manufacturing. Types, quantities and operational dimensions of the facilities are included. *Jeffrey Mfg. Co.*

For free copy circle No. 2 on postcard, p. 93.

Grinder dogs

Cam-action grinder dogs are discussed in this new bulletin. The bulletin gives the capacities and prices of the sizes available. It explains that these dogs are now available with brass cams and screws as well as steel. *Ready Tool Co.*

For free copy circle No. 3 on postcard, p. 93.

Lubricants

Molykote lubricants are discussed in this new leaflet. Molykote microsize powder is covered. Features of the powder are listed. The importance of particle size is discussed. Specifications and other Molykote lubricants are listed. *Alpha Corp.*

For free copy circle No. 4 on postcard, p. 93.

Drums

Arco rubber lined drums are covered in this new leaflet. "Drum-serts," or linings, are described, and "Handy Tanks," or rubber-lined drums are shown. "Snap-on" lids are also discussed. Specifications are included. *Automotive Rubber Co.*

For free copy circle No. 5 on postcard, p. 93.

Gaging

Automatic gaging and size control is the subject of this new folder. Automatic gaging with air is covered. Several Air-Electric installations are shown and described. *Taft-Pierce Mfg. Co.*

For free copy circle No. 6 on postcard, p. 93.

NON-FLUID OIL
TRADE MARK REGISTERED

PLUS FOR PRESSURE SYSTEMS

NON-FLUID OIL is outstanding for pressure systems! Check these NON-FLUID OIL plus values:

- 1. Does not dry out like ordinary greases!
- 2. Will not separate under pressure!
- 3. Will not choke the system!
- 4. Contains no residual matter to clog fittings!

NON-FLUID OIL proves itself in performance. Send for free testing sample, without obligation, and see it in action. Useful Bulletin will also be sent.

NEW YORK & NEW JERSEY LUBRICANT COMPANY
292 Madison Ave., New York 17, N. Y. • Works: Newark, N. J.
WAREHOUSES: Birmingham, Ala. • Atlanta, Ga. • Columbus, Ga.
Charlotte, N. C. • Greensboro, N. C. • Greenville, S. C. • Chicago, Ill.
Springfield, Mass. • Detroit, Mich. • St. Louis, Mo. • Providence, R. I.
Also represented in other principal cities

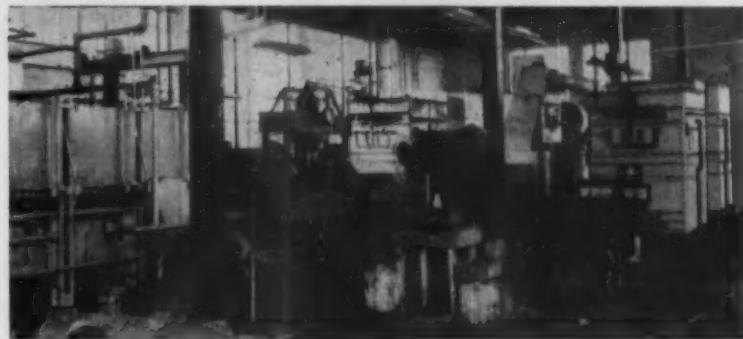
NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

FREE TECHNICAL LITERATURE

Gear hobber

The Michigan Tool Co.'s Model 1445 Ultra-Speed gear hobber is covered in this new bulletin. The features of the hobber are pointed out. Design and construction detail are described. Case histories are given. Diagrams show the operating functions of the machine's universal spindle head design, and its drive and hydraulic systems. The machine's adaptability to automation is also covered. Specifications are included. *Michigan Tool Co.*

For free copy circle No. 7 on postcard, p. 93.



Multipress

The Denison hydraulic Multipress is the subject of this new catalog. The catalog also contains material on hydraulic pumps, controls, fluid motors and valves in addition to the information about the Multipress. The Multipress is shown in action on the production line and the various operations possible are described in detail. *Denison Engineering Co.*

For free copy circle No. 8 on postcard, p. 93.

Die casting

A new approach to die casting is the topic of this new bulletin. The bulletin describes in detail the development of an all-new clamp design and a new advanced-design injection end which are self-contained units. Specifications are included. *Hydraulic Press Mfg. Co.*

For free copy circle No. 9 on postcard, p. 93.

Barrel finishing

Barrel finishing techniques and products are covered in this new booklet. The booklet explains how barrel finishing works, what types of parts can be barrel finished, and what operations barrel finishing performs. It contains an illustrated case history section pointing out how manufacturers of many types of parts are using barrel finishing, and it lists materials needed for the process. The booklet also lists the complete line of "Hinite" chips, compounds and equipment, and features step-by-step pictures of barrel finishing operations. *Minnesota Mining & Mfg. Co.*

For free copy circle No. 10 on postcard, p. 93.

Turn Page

Niagara Aero Heat Exchanger quickly pulls down the initial peak load of heat in quenching . . . and saves cooling water

Accurate control of quench bath temperatures and quickly effective capacity to handle the initial peak load of heat in quenching prevents production set-backs, increases the output of your heat treating department, prevents oil fires, saves you losses from rejected parts.

Niagara Aero Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Write for Bulletin #120 giving complete information.

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. IA, 405 Lexington Ave.

New York 17, N. Y.

Experienced District Engineers in all Principal Cities

FREE TECHNICAL LITERATURE



GET LONGER FURNACE LIFE

Use this 5-point LACLEDE-CHRISTY MAINTENANCE PLAN

These suggestions help you lower costs by reducing furnace down time and increasing furnace life:

1. Make an on-the-job study of your problems. Let Laclede-Christy engineers consult with your engineers in your plant.
2. Analyze your problems with Laclede-Christy mechanical, combustion and refractory engineers. You receive the benefit of Laclede-Christy experience with similar problems.
3. Get recommendations covering refractory materials best suited to your needs. Get complete instructions on proper application.
4. Make periodic check-ups with your Laclede-Christy Service Engineer. He's available on short notice.
5. Use refractories available from stock in a nearby Laclede-Christy or distributor warehouse—or direct from a Laclede plant. Shipment in most cases two or three days within receipt of order. Call or see your Laclede-Christy representative soon.

LACLEDE-CHRISTY COMPANY



DIVISION OF H. K. PORTER COMPANY, INC.

2000 Hampton Avenue • St. Louis 10, Missouri
Mission 7-2400

Inaugurating a new era of service to the industrial heating industry



FREE TECHNICAL LITERATURE

Aluminum

The growing applications of aluminum in the process industries are described in this new brochure. The brochure outlines the economic and technical advantages of aluminum used in processing equipment for chemical and material storage, and for transporting liquids. Among products described are heat exchanger tubes, coiled tube, steam traced piping, pipe and fittings, standard storage tanks, tank cars and shipping containers. *Aluminum Co. of America.*

For free copy circle No. 11 on postcard, p. 98.

Eichleay

Many recent installations of equipment by Eichleay Corp. are shown and described in this new booklet. Among services listed are industrial construction, complete plant erection, installation of industrial equipment, structural steel erection, relocation of industrial units, shoring, rigging and building moving. Recent projects are pictured and described. *Eichleay Corp.*

For free copy circle No. 12 on postcard, p. 98.

Rotoblast

The Pangborn Corp. type RG Rotoblast unit used in the company's blast cleaning machines is described in this new bulletin. The system is described and construction features are shown. Among advantages listed are high quality, speed, savings in time and cost, and versatility in application. The simplicity of operation and maintenance of the unit is emphasized. *Pangborn Corp.*

For free copy circle No. 13 on postcard, p. 98.

Folder brakes

Folder brakes for folding and tangent bending are discussed in this new folder. Among the advantages listed for the brakes are fast, accurate production, simple design, minimum cost, fully automatic operating cycle, and interchangeable radius and sharp dies. Single wing folder brakes and double wing folder brakes are shown and discussed. *Dreis & Krump Mfg. Co.*

For free copy circle No. 14 on postcard, p. 98.

Turn Page

THE IRON AGE

Built for SEVERE DUTY frequent starting • inching • reversing • dynamic braking

ALLIS-CHALMERS

Type 256
AIR CONTACTOR

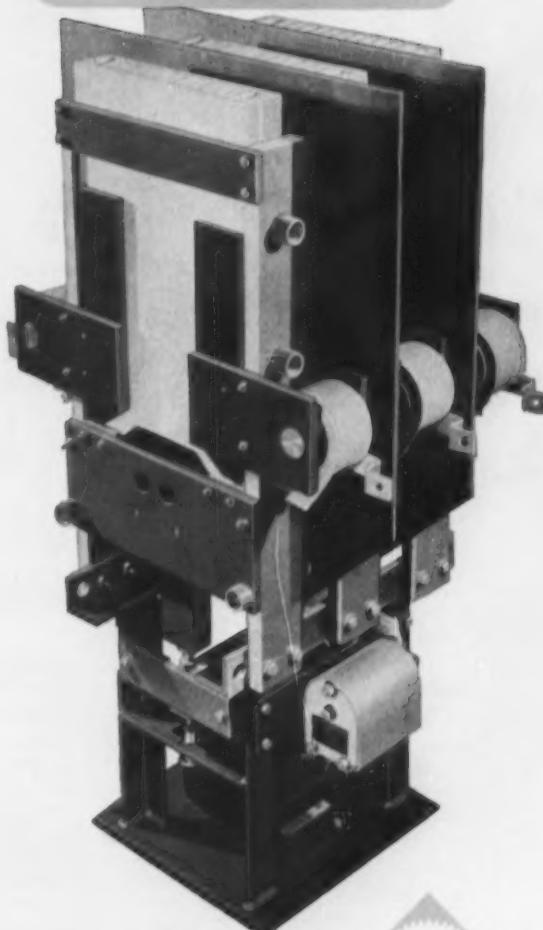
FOR 2300 TO 5000-VOLT
MOTOR CONTROL

Durability and long-term dependability were given prime consideration in the design of the Allis-Chalmers Type 256 air-break contactor. As a result, the roughest repetitive duty becomes routine — contact operations are actually numbered in the millions with a minimum of servicing.

DESIGN FEATURES

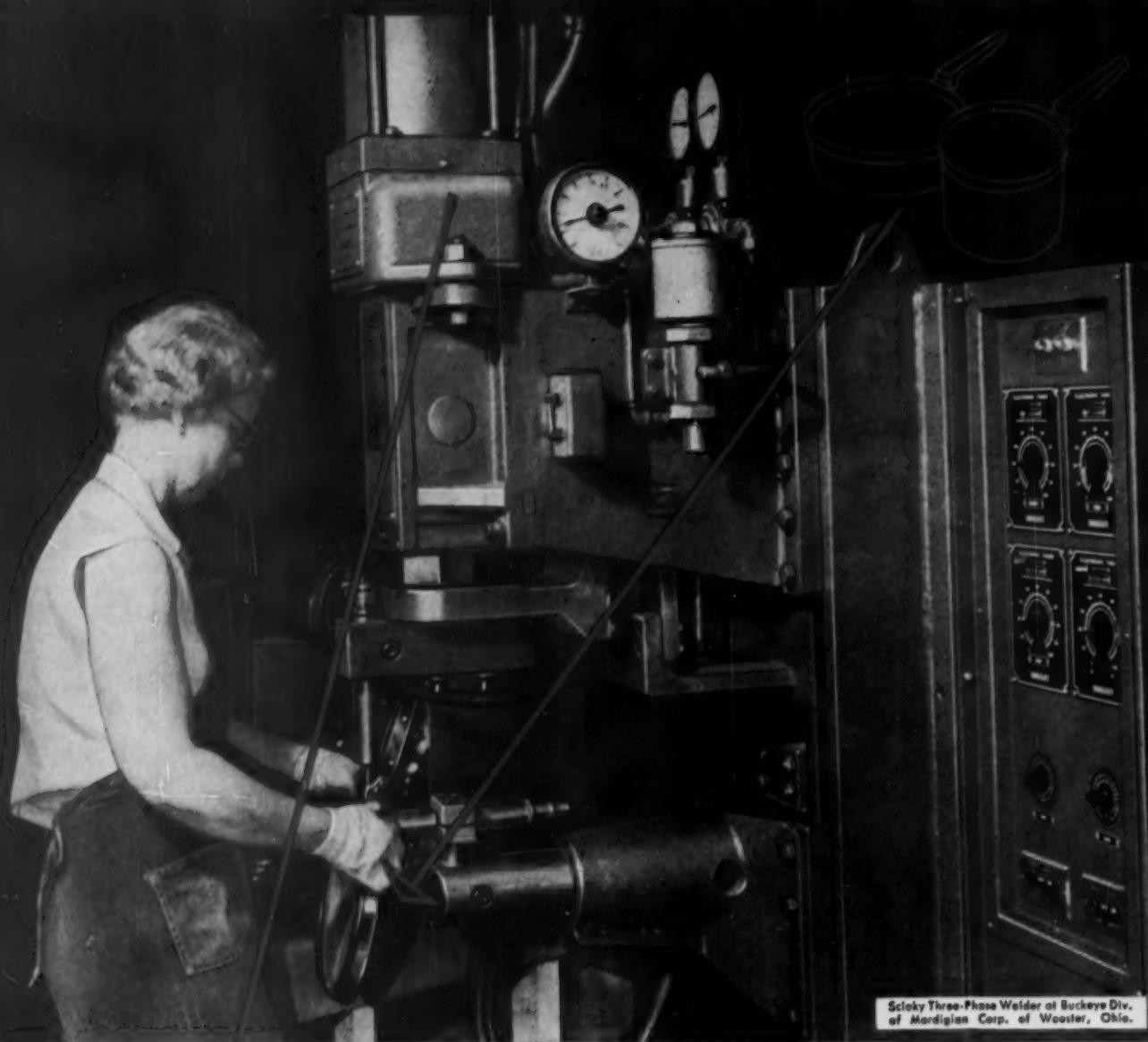
By utilizing a simple vertical motion and double break contacts, troublesome maintenance factors, such as mechanical linkages, turning shafts, shaft bearings and flexible leads, have been eliminated. From the operation standpoint, two gaps in series cut arc voltage in half. Rapid arc extinction is further facilitated by magnetic blowouts at each gap, operating with arc chutes designed to take full advantage of dual blowouts.

In Allis-Chalmers Type H high voltage starters, Type 256 air-break contactors — along with meters, overload relays, current limiting fuses, auxiliary switches — are coordinated to meet heavy duty demands — to provide high capacity interruption and complete protection for man, motor and machine. For complete information see your nearby A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for bulletins 14B6410B and 14B7303.
A-4325



ALLIS-CHALMERS





Sciaky Three-Phase Welder at Buckeye Div.
of Mardigian Corp. of Wooster, Ohio.

PRODUCTION JUMPS 375%...

Costs Cut Sharply with Sciaky Patented Three-Phase Welders

**FACTS ABOUT
SCIAKY PATENTED THREE-PHASE**

	SINGLE-PHASE	SCIAKY THREE-PHASE	SAVINGS
TRANSFORMER RATING	250 KVA	100 KVA	150 KVA
WELDING KVA DEMAND	650 KVA	325 KVA	325 KVA
LINE AMPS PER CONDUCTOR 440 V.	1,476 A.	430 A.	1,046 A.
POWER FACTOR	20%	85%	Greatly Improved
INSTALLATION COST—EST.	\$10,500	\$5,250	\$5,250

Buckeye, with an enviable 52 year record of manufacturing, uses Sciaky patented Three-Phase Balanced Load, High Power Factor resistance welders extensively in fabricating high quality aluminum kitchenware. Standard Sciaky Three-Phase Welders increased production 375% over riveting in joining a variety of handle mounting brackets to different size pans. Even beyond the savings in costs of rivets and related tooling, Sciaky Balanced Load Three-Phase with 85% power factor (compared to 30% for conventional single phase) and a 50% reduction in power demand, is far less expensive to operate than conventional single phase unbalanced load welders. Sciaky Three-Phase readily solves power problems, and further, installation costs are estimated at only half of single phase installation cost. Write today for "Resistance Welding at Work", Vol. 4 - No. 2. Read the complete details of Buckeye's impressive application of Sciaky basic thinking—welders designed to do more useful work at lowest operating cost with maximum reliability.

*Largest Manufacturers of Electric
Resistance Welding Machines in the World*

SCI AKY

Sciaky Bros., Inc., 4923 West 67th Street, Chicago 38, Ill.

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 88

Turret lathes

Cut Master vertical turret lathes are the subject of this new booklet. Among features discussed are adjustable feed stops, angular turning, constant surface feed, contour turning, electrical control, pendant control, and extra equipment. Capacity charts are included. Specifications are given. *Bullard Co.*

For free copy circle No. 15 on postcard.

Cranes and monorails

The Philadelphia Tramrail Co. line of cranes and monorails is described in this new folder. Among items shown are the Cable King electric hoist, Midget King electric hoist, Monorail slide switch, overrunning hand geared single I-beam crane, under-running motor driven single I-beam crane and Monorail tongue switch. *Philadelphia Tramrail Co.*

For free copy circle No. 16 on postcard.

Wire and cable

General Electric Flamenol wire and cable is covered in this new bulletin. The bulletin contains application, product and technical information on Flamenol wire and cable. The wire and cable may be used for machine tool, appliance, traffic-control, station-control and electric equipment. Among wire and cable discussed are Geotrol gasoline-and oil-resistant wire, Flemenol bus-drop cable, neon sign cable, and audio drive-in theater cable. *Construction Materials Div., General Electric.*

For free copy circle No. 17 on postcard.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 1/27/55

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page..... Product.....
Page..... Product.....
Page..... Product.....

..... Your Name

..... Title

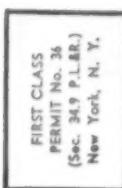
..... Company

..... Co. Address

..... City

..... Zone

..... State



THE IRON AGE
Post Office Box 77
Village Station
NEW YORK 14, N.Y.

Turn Page

FREE TECHNICAL LITERATURE

Lead treated steels

How lead treated steels are produced, their important production advantages and case histories of their use are featured in this new booklet. Stressed is the fact that lead exists in Copperweld's Aristo-loy steels as lead—it does not form a lead compound or alloy. The presence of lead acts as lubricant and reduces friction, produces a better chip formation and allows higher machining speeds, according to the booklet. Characteristics and other properties are given in tables and graphs. *Copperweld Steel Co.*

For your copy write on your company letter-head to address shown on reply card.

Casting

Zinc and die casting is discussed in this booklet. Contained in the booklet are technical data on the role of zinc as a base metal for die casting alloys, the variety of commercial finishes which may be applied to zinc base die castings and the manifold applications of such castings in industry. The booklet discusses the advantages of die casting as a method of production and gives historical background. Also included is a step-by-step description of the electrolytic method for refining zinc. *St. Joseph Lead Co.*

For free copy circle No. 21 on postcard.

Selenium rectifiers

High temperature selenium rectifiers made by Fansteel Metallurgical Corp. are reported on in this engineering information folder. These rectifiers are designed to operate continuously at room temperature ratings in ambient temperatures up to 212°F. The bulletin lists many types and sizes of high temperature rectifier cells, their d-c output ratings in various single phase and three phase circuits. Life and aging characteristics, voltage drop, circuit formulae and constants, and protective coatings are also discussed. *Fansteel Metallurgical Corp.*

For free copy circle No. 22 on postcard.

FOR MORE LITERATURE

Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

"Ramset"

"Ramset—New and Unusual Applications" is the title of this new booklet. The booklet discusses new uses of this magnesia ramming mix, designed for original bottom construction and maintenance of open hearth and electric steel producing furnaces. Among the lesser known applications discussed are its uses for rammed runners, short spouts and aprons, furnace construction, mold stools and setting ladle nozzles. *Basic Refractories, Inc.*

For free copy circle No. 23 on postcard.

Milling arbors

The Lovejoy Tool Co. complete line of milling cutter arbors is covered in this new folder. The arbors are made of alloy steel, heat treated for toughness and precision ground. Among products shown are standard shell end mill arbors, centering plugs, heavy duty flanged arbors and end mill holders. Diagrams and tables give additional information. Complete specifications are included. *Lovejoy Tool Co.*

For free copy circle No. 24 on postcard.

Worm gear sets

The Foote Bros. Gear & Machine Corp. line of worm gear sets is covered in this new catalog. The sets are described and illustrated. Suggested applications include cranes and hoists, machine tools, furnace drives and metal mills, and other equipment with shock load or uniform load characteristics. Ratings and specifications are given. *Foote Bros. Gear & Machine Corp.*

For free copy circle No. 25 on postcard.

THE IRON AGE

POSTAGE WILL BE PAID BY

Post Office Box 77

Village Station

NEW YORK 14, N.Y.

BUSINESS REPLY CARD
No postage necessary if mailed in the United States



Postcard valid 8 weeks only. After that use 1/27/55 own letterhead fully describing item wanted.

Circle numbers for Free Technical Literature or Information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

If you want more details on products advertised in this issue fill in below:

Page Product

Page Product

Page Product

Your Name

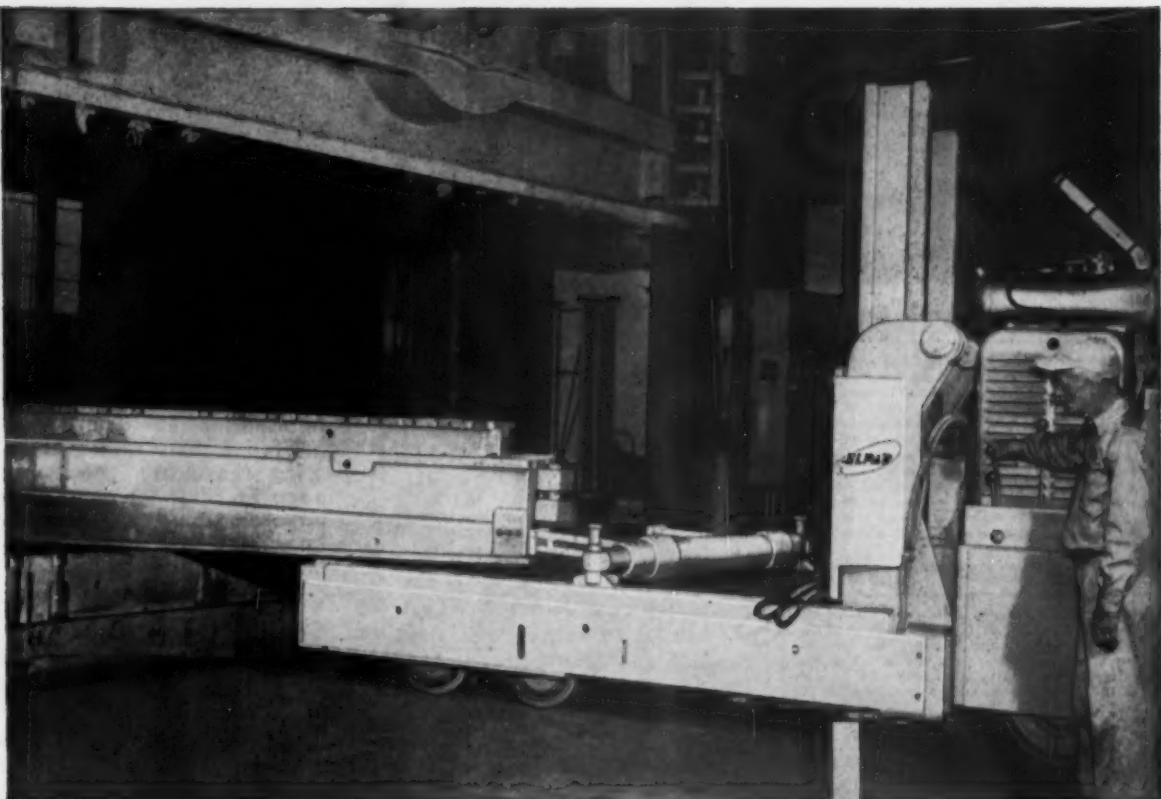
Title

Company

Co. Address

City Zone

State



Exclusive Features of NEW **ELPAR*** Die Handler *Speed Die Changing*

Fast changing of stamping and forging dies is a "must" to keep waiting time of huge presses at a minimum. The entirely new line of ELPAR die puller trucks handles 5 to 50-ton dies with unmatched speed and safety. Here are some of the reasons:

FINGERTIP CONTROL—Exclusive *hydraulic* operation of both lift and die pulling mechanism permits "inchng" action. Hydraulic valves can be barely cracked to permit accurate positioning of platform and alignment of die in press. Such exactness is impossible with electric controls.

INDEPENDENT OPERATION OF PUSHER ARMS—Pusher arms can operate together or separately to maneuver die. If necessary, a die can be pushed off diagonally even when platform is not square with press bed. This saves time of maneuvering truck. Die can be turned as it is pushed into press.

LOWER PLATFORM—Because today's press beds are lower, ELPAR trucks provide lowest possible platform with no sacrifice in capacity.

FULL VISION—No lift chains or cables between uprights, and no cross member at top. End control permits view of entire truck.

MANEUVERABILITY—Effortless hydraulic power steer. Short turning radius because all wheels steer.

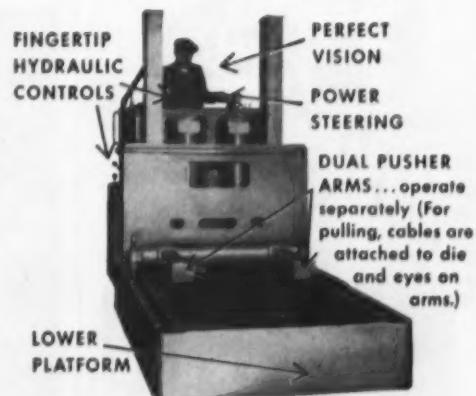
Elwell-Parker trade name.

THE ELWELL-PARKER ELECTRIC CO.
4294 St. Clair Avenue
Cleveland 3, Ohio

January 27, 1955

ELPAR truck in Lockheed aircraft plant. Note that operator is using remote controls. Die is being turned as it is pushed into press. In only 8 minutes, truck picks up from storage, delivers, and positions a multi-ton die!

ELPAR FEATURES:



ASK FOR FULL FACTS ON NEW ELPAR DIE PULLERS

TECHNICAL BRIEFS



STRUCTURAL STEEL FABRICATORS

POLLASKY AUTOMATIC SPACERS insure huge savings in the fabrication of steel and will cut your costs of punching holes in iron. Rapid punching using only ONE OPERATOR. The spacing bars used can be rapidly set and eliminate all template making and marking of iron. These Spacers operate on forward and return travel allowing angle iron to be punched in both legs at one handling. Simple to operate. These Spacers can be designed to operate with your present punch in any size to handle your range and length of work.

STEEL STAMPING PLANTS

Set up with a blanking press this AUTOMATIC SPACER will feed any size or length of plate. A series of blanks can be cut on the forward travel and a new series of blanks cut on the return travel. Can also be used with a shear or saw for cutting off operations. Full automatic operation. Consult us for special applications.

POLLASKY ENGINEERING CO.

3802 N. 38TH STREET
MILWAUKEE 16, WIS.

PROCESSING: Abrasives Plant

Modern sandpaper plant—a machine three city blocks long . . . Electronic, nucleonic, mechanical and air equipment used to control operation of unusual setup.

A sandpaper maker—a machine three city blocks long—was put into operation this month by Minnesota Mining & Mfg. Co., St. Paul, Minn.

The huge 976-ft-long plant, a unique structure, is actually a single manufacturing unit with a shell built around it. The new maker will enable the 3M Company to take advanced pilot plant research and development and apply it to the manufacture of improved coated abrasives.

Electronic, nucleonic, mechan-

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 93. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

ical and air equipment in the maker control machine speeds, curing temperatures, bond viscosities and other variable factors. Penetrating radiation in the form of beta rays measures uniformity of coating thickness and coating weights as the continuous web of coated abrasives passes through the maker to the drying tunnels. A battery of recorders keeps a continuous check on each operation in the manufacturing process.

Size and shape of the maker were largely determined by its massive curing ovens—topped by giant exhaust vents and make-up air heaters—which extend some 900 ft along the top of the plant's first-level warehouse.

Smooth Materials Flow

From the warehouse, key to a modern materials handling system, minerals and raw materials for adhesives are elevated to the top of the maker, where they begin their flow towards the finished product.

Minerals are gravity-fed to the coating chambers. Adhesive components are placed in large mixers, then piped to the manufacturing level. Meanwhile, minerals and adhesives for the next production run are already "on deck" to facilitate a swift changeover of the making run to another type of coated abrasive.



A sandpaper "machine" . . .



Central control panel . . .

TECHNICAL BRIEFS

The main floor of the warehouse—underneath the maker's machinery—is connected by tunnels to drum stock storage levels of the converting buildings.

In addition to railroad trackage, one end of the maker has four truck platforms, each of which has an adjustable ramp which can be raised or lowered to coincide with the height of a truck's bed or tailgate.

Testing:

Air speeds up inspection of adding machines.

An unusual application of air and air cylinders has speeded the final inspection of adding machines to almost ten times that of older methods. Designed and built by research engineers of the Burroughs Corp., Detroit, for testing 10-key adding machines the device may have applications in other metalworking operations.

Total cost of the equipment was \$6000. The commercial inspection test puts machines through a much more rigorous work-out than they would ever receive in business use. Production men point out the tester enables them to speed up this vital, yet formerly time-consuming process to a point where they are able to run more test schedules on each machine than ever before. It is also being used to run exhaustive endurance tests. The tests can be run simultaneously.

Can Test Other Machines

The basic principle of the machine can be used to build testing machines that can be adapted to running commercial inspection tests on any of the many business machines that Burroughs builds.

Utilizing air pressure and a master control machine with a light control indexing indicator on it, the operator runs through an operation schedule after 10 new machines have been set in place.

The master control machine looks like an ordinary adding machine, but consists only of a case and a keyboard. Beneath the keys are microswitches.

Keep your eye on Buckeye

for everything new in
air and electric power tools!



90° ANGLE HEAD NUTRUNNER

¼" CAPACITY

Here's a brand-new Buckeye nutrunning tool, made to order for those costly jobs where operating space is limited. Gets right into the tightest corners, runs nuts and assembly costs down in a jiffy.

Has heavy-duty 90° angle head, designed for lowest overall tool head height. Adapter is an integral part of tool spindle to help reduce backlash. Accommodates full range of ¼" square drive sockets, for hex or square nuts.

There are no exposed moving parts to damage workpiece or injure operator. Bevel gear, ball bearing and spindle are separate units, each easily and economically replaced if necessary. Lever and Lock Button throttle models.

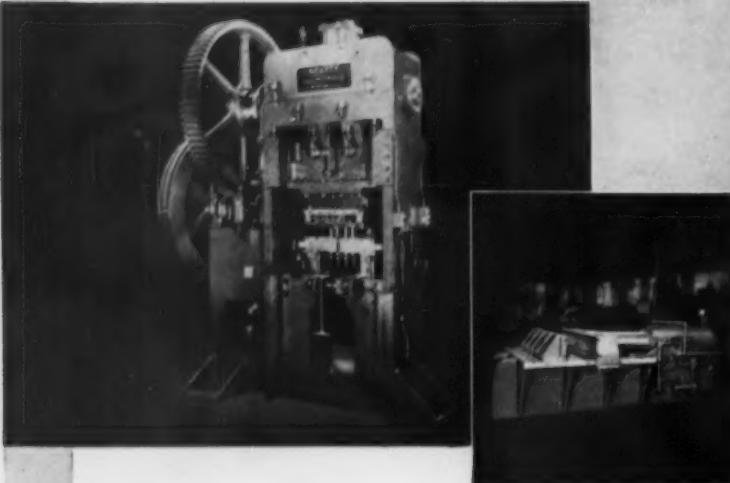
You can test-prove this new Buckeye nutrunner in your plant, without obligation. Just tell us where and when—we'll take care of the rest, and then you can be the judge!

Buckeye Tools
CORPORATION
DIVISION 11 • DAYTON 1, OHIO

producers of
the world's first
successful
rotary air tools

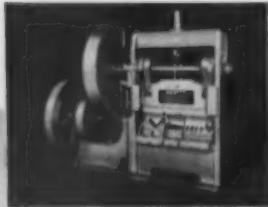
Beatty Beam Punch has ADJUSTABLE TOOLS

-punches flanges in "I" and WF beams!



Here's a new versatile Beatty machine that is ideal for the structural steel fabricator who runs a miscellaneous job shop and requires frequent set-up changes. The new guillotine beam punch, with 200 ton capacity, features built-in adjustable tools for flange punching "I" and Wide Flange beams. A turn of a handwheel provides quick change of punching centers and synchronizes punch with die at the same time. These tools consist of two frames which open and close about the center line of the beam. It has four punching units; minimum inside setting is $2\frac{1}{4}$ ", maximum $6\frac{3}{4}$ ". Centers between inside and outside punches can be adjusted from $2\frac{1}{4}$ " to $3\frac{1}{2}$ ". For specific details on improving metal fabricating production—consult your Beatty engineer!

BEATTY
MACHINE & MFG. COMPANY
HAMMOND, INDIANA



BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

BEATTY Horizontal Hydraulic Bending for heavy forming, flanging and bending.



BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.



BEATTY Seaming Table handles web and flange punching without roll adjustments.



BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

"Worms and Worm Gears," third of a series of five textbooks on power transmission equipment. A book on gear engineering problems helpful to machine designers, maintenance men, and purchasing agents. Boston Gear Works, Quincy 71, Mass. \$3.25.

"Business and Economic Forecasting." Most businessmen have to use, or make, some type of economic forecast to serve as a guide for business decisions. Here's a little book that can help you become wise in the lore and mechanics of forecasting. Explained are the fallibility, seasonality, fashion, and motivating forces which affect forecasts. It gives helpful warnings for forecast users and can prove generally useful to the businessman. Chamber of Commerce of the United States, Washington 6, D. C. 50¢. 30 p.

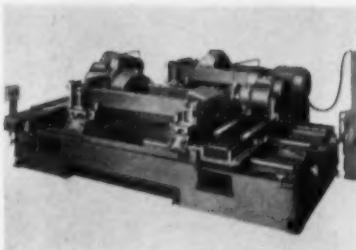
"The Story of Tire Beads and Tires," by W. E. Burton; prepared under the sponsorship of the National Standard Co. Technical handbook gives data and descriptions of the design and manufacture of tire beads. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. 196 p. \$5.00.

"Grundzüge der Zerspanungslehre," by M. Kronenberg. In German. Covers the fundamentals of metal cutting and their practical application. Contains laws for cutting speed, cutting force, horsepower, tool life, size effect and other such quantities. Gives principles for most economical use of machine tools. Springer-Verlag, Reichpietschufer 20, West-Berlin 35. 430 p. 48 marks.

"Shoe Machinery: Buy or Lease?" by R. N. Anthony. Discusses the underlying considerations and methods of approaching the problem of renting or buying shoe machinery. National Shoe Manufacturers Assn., 342 Madison Ave., New York 17. \$3.50. 59 p.

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies...for more data use the free postcard on page 93 or 94



Duplex machine mills ends of tractor frames

Application of duplex milling for handling large, awkward parts is found in a new machine that mills both ends of tractor frames. Two, floor mounted, load-unload benches are provided and duplicate fixtures make possible loading and unloading of one fixture while milling simultaneously on the other. Right

and left hand milling units are standard, heavy duty, Model M-30. Milling heads are individually motor driven by 30 hp, 1800 rpm motors. Machine is adjustable 6 to 11 ft for length of piece being milled. *Motch & Merryweather Machinery Co.*

For more data circle No. 26 on postcard, p. 93.

Drum-type machine drills at rate of 12 ipm

A special 9-station drum-type high production machine drills, taps and chamfers a complete range of fuel pump bodies. Different pump models are interchanged on the machine by substituting the proper auxiliary head for different bolt circles. Heads are cluster style which facilitate changeover. They are designed

to operate high speed cutting tools at maximum speeds. Composed of right and left stations, the machine cycles completely in 21 sec, drilling, tapping and chamfering 57 different holes in 14 different sizes, from 0.062 to 1 $\frac{1}{8}$ in. diam, 20 to 32 threads per in. *Barnes Drill Co.*

For more data circle No. 27 on postcard, p. 93.



Belt grinder for close tolerance metal working

New abrasive belt grinder, the BG-8 Automat, flat-grinds and polishes small metal parts. It is equipped with a self-powered, continuous work feed and an 8x107 in. abrasive belt. Workpieces for the unit are manually loaded but automatically ejected. The feed unit has 21 fixture plates, each 3 $\frac{3}{4}$ x 6 $\frac{1}{4}$ in. Number of parts that can be loaded on each plate is limited

only by their size. Moved by parallel roller chains, each fixture plate is tracked to the leading edge of the abrasive belt. As work advances to the belt surface, it is fed slowly across the belt, then is retracted quickly. Feed speeds are variable. Production rates up to 14,000 or more pieces per hr are possible. *Engelberg Huller Co.*

For more data circle No. 28 on postcard, p. 93.

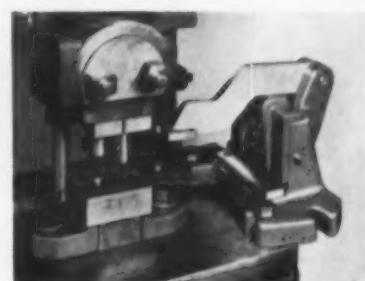
Scrap chopper operates with stroke of the press

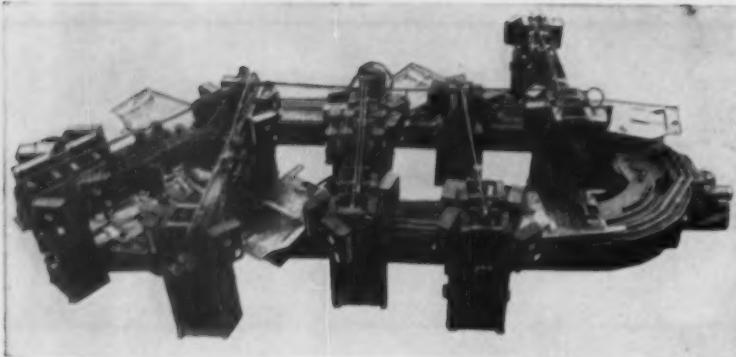
Constructed of heavy castings to give years of trouble-free service this rugged compact scrap chopper can be easily installed close to the die by means of two bolts. It is powered by the press ram completely independent of the die or tool and operates with each stroke of the press. It can operate in and

from any position on the press bed, with the scrap cuttings falling into a container eliminating extra handling. Blades are shear cut to give maximum capacity and cutting strength with minimum effort. *Durant Tool Supply Co.*

For more data circle No. 29 on postcard, p. 93.

Turn Page





Early example of Federal Resistance Welding Automation is this Floor Pan Welder for a leading automobile builder. Placed into operation in 1938 it featured continuously moving fixtures and walking guns. Produced 250 units per hour.

Why All This Talk About Automation?

The automatic handling of work in process isn't a new idea. Leading manufacturers in almost every metal working field have been using "automated" machinery for years to increase the productivity of their work.

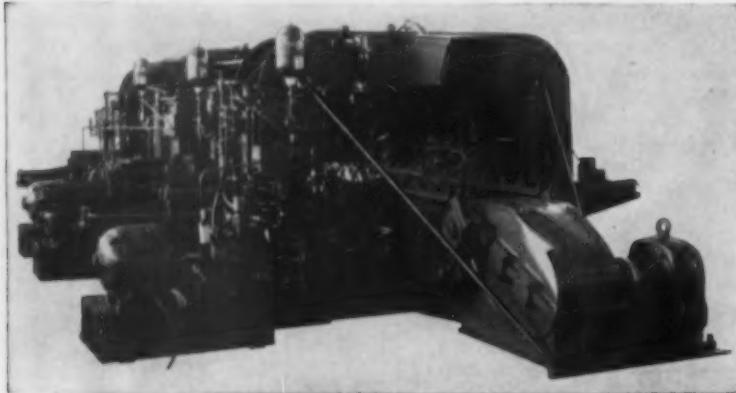
The talk about automation today, of course, is a result of the concentrated effort on the part of vast numbers of manufacturers, large and small, to stay competitive by trimming production costs whenever possible.

Federal, for almost a quarter century, has been working with such people in developing resistance welding machinery that would reduce costly, non-productive handling to a minimum.

While automation may be new to many machine builders Federal design engineers have piled up 25 years experience in designing and building automatic handling and assembling equipment, dial, shuttle and transfer feeds for resistance welding. A big reason why you should take your welding problems to "Federal — First in Resistance Welding."

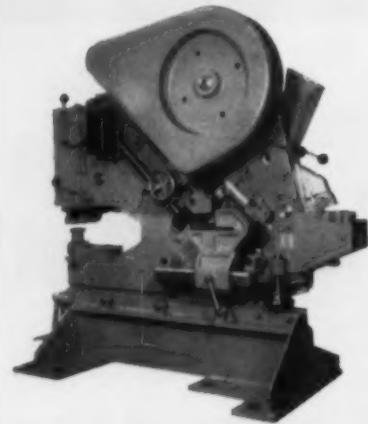
The Federal Machine and Welder Co., Warren, Ohio

Modern Example of Resistance Welding Automation is this Federal Special Three-Station Transfer Type Muffler Assembly and Welding Machine. It produces 600 complete assemblies per hour. Reduced labor forces required by several hundred per cent.



Performs four operations

Heavy duty steel plate shears are combined with a puncher, section and miter cutter, and notcher in the Mubea Type KBL universal steel fabricator. The plate shears will accommodate all widths and lengths and can also handle flats.



The punch has a center spotter to insure accuracy, and the design allows utilization of a wide variety of cutting and punching tools. The section shears cut angle iron, round, square and T-bars without changing knives. A triangular or rectangular notching tool can be used. *Alwin Fr. Wilkens, Inc.*

For more data circle No. 30 on postcard, p. 93.

Jet-propelled lubricant

Speedily applied by light thumb pressure, new Graphite Squirt, instantly clears frozen or rusted locks. A specially-designed rubber cap keeps this non-greasy lubricant



from surrounding areas, directs jet spray to lubrication points. When lubricant's carrier dries out, a fine film of graphite remains as permanent, rust-inhibiting lubricant. *Gebauer Chemical Co.*

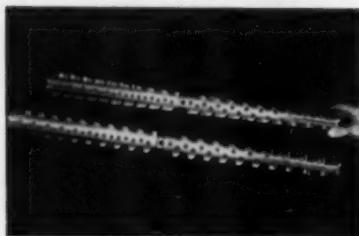
For more data circle No. 31 on postcard, p. 93.

Arc welder provides choice of ac or dc current

Called the Idealarc, a new combination arc welder provides a welding arc for every type of manual welding application, permitting selection of either ac or dc and either a soft or forceful arc. Idealarc permits welders to select the proper welding arc for their application. The machine can be obtained as an ac welder without the dc current. To this unit a dc package can be easily attached in about 1 hr whenever desired. The welder is also available as a combination ac and dc machine with

selection of current made through a simple twist of a switch handle. Different output capacities of dc and ac can be combined to fit the machine to the job requirements. Both voltage and amperage are controlled to give the desired control of arc characteristics. An arc booster switch permits selection of normal or hot starting. Current models available are 300, 400 and 500 amp ac combined with dc capacities in 200, 300, 375, and 450 amp. *Lincoln Electric Co.*

For more data circle No. 32 on postcard, p. 93.

**Inserted-tooth broach permits heavy cuts on cast iron**

A Red Ring inserted-tooth carbide surface broach is designed to avoid chatter and cut tool costs when taking heavy cuts on semicircular cast iron surfaces. They feature a broach bar having machined integral lugs which back up each of the inserted carbide tipped tools.

Length of broach required to finish a semi-circular surface or a portion of a circular surface depends on the width of the surface, the amount of stock to be removed and stroke of the broaching machine. *National Broach & Machine Co.*

For more data circle No. 33 on postcard, p. 93.

Portable drill press eliminates disassembly work

An all-angle portable drill press of new design and construction will drill and tap from practically any location with its machine spindle in almost any position. It combines the advantages of conventional fixed radial drill with those of the portable. As a great time and labor saver, it permits bringing the machine to the job and eliminates disassembly of large and heavy work pieces and hand drilling and tapping operations. The Portable will drill as close as 14½ in. to, and 38 in. away from its column.

Head rotates on a graduated swivel 360° from vertical; drill head rotates 360° on the column. It has four speeds, 185, 280, 400 and 600 rpm, with a 4-sec average speed change. Drilling capacity is 1½ in. and tapping capacity ½ in. in cast iron and a spindle drilling depth of 5 in. Maximum distance from the spindle to base is 59 in. but any column height can be ordered to suit customer requirements. *Sun Tool & Machine Co.*

For more data circle No. 34 on postcard, p. 93.

**Electric fork truck with side loading attachment**

With this side loading and unloading attachment, it is possible to place material in racks and remove it without turning the truck in the aisle, saving greatly in aisle width and time. Combination of a power-driven conveyor and a side-shifter makes it possible to transfer long loads directly into storage racks equipped with rollers with a minimum of truck maneuvering. Rollers of the 76-in. long conveyor are

rubber covered and are 24½ in. long. Unit loads to 70 x 24 in., weighing 500 lb or more can be handled by the truck. Rollers are power driven by a drive chain connected to a hydraulic motor run from the central hydraulic system of the truck. The side-shifter moves the entire conveyor a distance of 15 in. *Lewis-Shepard Products, Inc.*

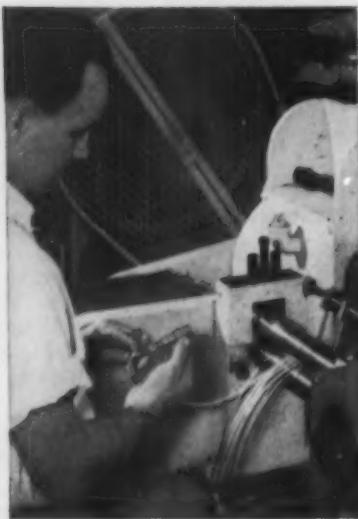
For more data circle No. 35 on postcard, p. 93.

Turn Page

MONEL • NICKEL • COPPER • ALLOYS

THIN STRIP

for exacting standards only



Not one strip rolling requirement in ten must be carefully "miked" to assure close width tolerance.

But that exceptional job is routine with Somers THIN STRIP. Monel, pure Nickel and Nickel alloys are rolled to within $\pm .5\%$ from .010" to .00075", with the same degree of accuracy in widths, and with the exact properties required by your product.

Modern rolling, annealing and precision control equipment assure uniform high quality under the most rigid specifications.

And Somers 40 years experience in a wide range of applications is available to help solve your strip problem without obligation.

Write for confidential data blank or field engineer.

FOR EXACTING STANDARDS ONLY

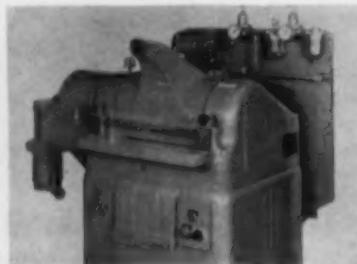
Somers

Somers Brass Company, Inc.
WATERBURY, CONN.

NEW EQUIPMENT

Gear speeders

New automatic cycle gear speeders cut gear inspection time. Features in the Model GSC, 10-in. OD capacity machines include air cylinder clamping and braking controls; and a pushbutton controlled automatic operating cycle in which the gear to be checked is run in con-

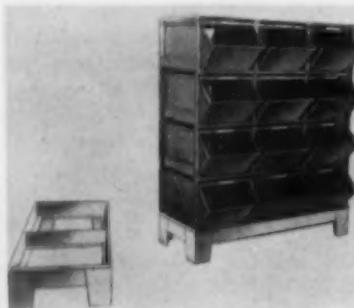


tact with a mating production gear or a master gear. These speeders are adapted to mass production gear inspection operations on spur and helical gears. Cycle adjustments and fixture changes can be made, permitting the machines to be feasible for many semi-mass production gear inspection operations. *National Broach & Machine Co.*

For more data circle No. 36 on postcard, p. 93.

Movable bases

Movable bases are made to hold various quantities of all sizes of Stackbin - Stackrack combinations. The units lock to the movable bases for safe, easy handling by fork



trucks, making possible unit load handling of production line supplies from stock room to assembly areas, at important savings in handling time. Under clearance of 8½ in. permits ample room for cleaning or fork truck handling. *Stackbin Corp.*

For more data circle No. 37 on postcard, p. 93.

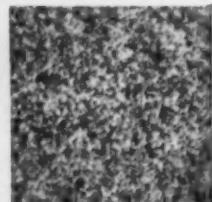
Somers

UNIGRAIN®

thin strip brass
for
deep drawing



Uniform fine grain size of Somers eyelet brass—less than .010 mm. (75X).



with
Fine Grain Finish

Somers Brass Company is pleased to announce the availability of a new, unique annealing process which makes possible a uniform fine grain of less than .010 mm. which can be drawn to full 40% elongation.

Developed in cooperation with the Selas Corp. of America this new process makes it possible to deep draw Somers THIN STRIP and still obtain a fine grain which is easily buffed to a brilliant finish.

And this new Selas Furnace provides high production as well as close control of temper and uniformity. It is typical of the modern equipment with which Somers produces copper, brass and other alloys to rigid specifications between .010" and .00075".

If you have a problem with thin strip, let Somers experience help you. Write for confidential data blank or field engineer.

FOR EXACTING STANDARDS ONLY

MONEL • NICKEL • COPPER • ALLOYS

THIN STRIP

Somers Brass Company, Inc.
WATERBURY, CONN.

Completes 52 operations per connecting rod

Special machine tool for processing connecting rods is a dial type with 6 stations: one for loading, two for drilling, one for chamfering, one for milling and one for reaming. The machine completes 52 operations per part, or a total of 23,400 on 450 connecting rods per hr at 100 pct efficiency. It drills, reams and chamfers the bolt holes;

drills, reams and chamfers the piston pin hole and mills the lock slot. Index table is fluid motor driven. Work holding fixtures are hydraulically power fed. Electrical and hydraulic construction is to JIC standards. Standards and special parts are interchangeable.

Cross Co.

For more data circle No. 38 on postcard, p. 93.

**Eliminates oil mist**

Electro-Staynew Mist Collector eliminates oil mist and smoke at its source. Designed to be mounted on or near high speed grinding and cutting machines, the unit removes over 90 pct of oil mist and smoke and returns clean air to the shop. Completely self-contained the unit provides a packaged ventilating system for individual machine tools. Advantages incorporated in three new models include unit construction, ease of installation and advanced safety features. *Dollinger Corp.*

For more data circle No. 39 on postcard, p. 93.

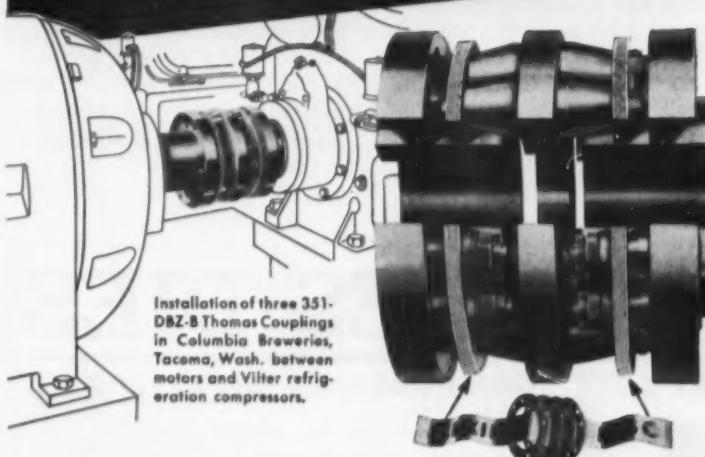
**Industrial puller**

Power and versatility are features of a new heavy bar type puller that provides 50 tons of power for big machinery jobs. It is rigidly built and specially heat treated to take the stresses and strains built up in breaking loose and removing rusted-on or tightly fitted gears, pulley wheels or similar objects. *Snap-On Tools Corp.*

For more data circle No. 40 on postcard, p. 93.

Turn Page

THOMAS FLEXIBLE COUPLINGS... for more years of better service!



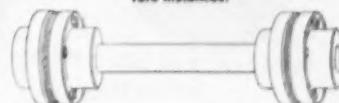
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash., between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACT	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.

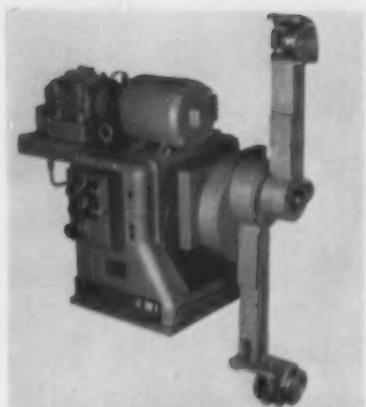


Write for our new Engineering Catalog No. STA



THOMAS FLEXIBLE COUPLING COMPANY

Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



Loader automates existing production equipment

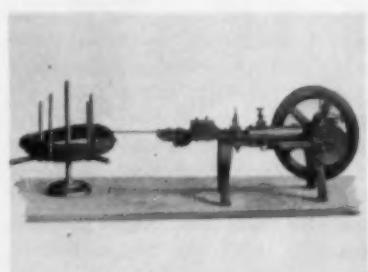
An automatic loader and unloader for machine tools is particularly adaptable to use with horizontal spindle machines such as lathes and grinders. It is extremely compact and may be used in many applications where space limitations have previously eliminated the possibility of loading automatically. The loader feeds a part to the machine from an incoming conveyor or a preceding machine and simultaneously removes finished part from the machine to an out-

going conveyor. Its two arms swing through 180° arcs about a central axis and carry work clamps on their outer ends. Work clamps are opened and closed through action of pneumatic cylinders which are located in the arms. Clutch and brake are controlled by limit switches. The loader may be mounted on its own cast base or directly on the machine or conveyor. *Hautau Engineering Co.*
For more data circle No. 41 on postcard, p. 93.

Small diameter wire straightened, cut quickly

Short lengths of wire from 1 to 12 in. long and to $\frac{1}{8}$ in. diam are straightened and cut to size accurately and quickly by the Lewis No. 7 wire machine. The machine can be hand operated for production of small quantities of wire, or belt or motor driven for increased production. Graduated

scale simplifies adjustment to produce any desired length of wire. Wire on reel adjustable to any size coil is fed through machine by reciprocating feed clutch and automatically straightened and cut to length. Wire is straightened by ten-roll straightener. *Lewis Machine Co.*
For more data circle No. 42 on postcard, p. 93.



PUNCHES·DIES RIVET SETS · COMPRESSION RIVETER DIES



Write Dept. B for New Catalog 54

Large inventory of stock sizes of round punches and dies, also rivet sets available for immediate shipment. Square, rectangular, oblong and elliptical shapes made to order.

Since 1903

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET

CHICAGO 8, ILLINOIS

Diameter gage

Model K 4R bench comparator checks inside or outside diameters. The built-in Acrament system of super fine adjustment with 0.010 range, and the precision of the gage provide the control and accuracy required for its use with me-

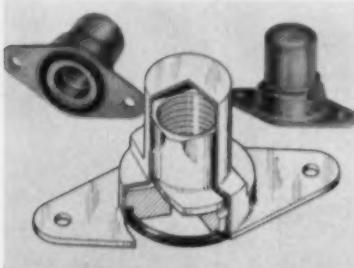


chanical indicator or air-probe type gaging. Standard jaws are adjustable for up to $\frac{1}{4}$ -in. high measurement setting. Range is maximum 5-in. OD and ID. Top plate is hardened and ground, non-rust chrome finish. Swing handle provides easy pressure and jaw retraction setting. *Acrament Gage Div., Myer Corp.*
For more data circle No. 43 on postcard, p. 93.

NEW EQUIPMENT

Self-sealing anchor nut

New self-sealing Locknut is designed to seal against liquid leakage in aircraft fuel tanks. An all-metal self-locking nut body is enclosed by a one-piece aluminum cap with a sealing ring in the base, to prevent leakage under the base of the nut and past the bolt

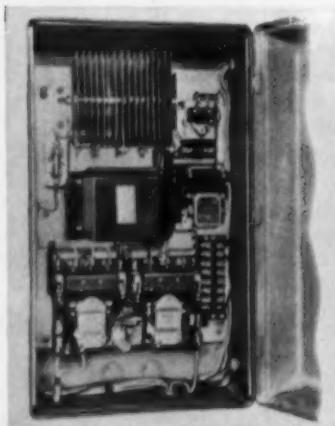


threads. Seal is effective whether bolt is in place or not. Nut body has a floating action of 0.025 in. in all directions, providing ease of assembly and allowing for misalignment of bolt holes. Nuts weigh approximately 1.20 lb per 100. *Elastic Stop Nut Corp. of America.*

For more data circle No. 44 on postcard, p. 93.

Braking controller

Compact dc braking controller no larger than a combination line-starter is available in two sizes of enclosures for braking standard induction motors from $\frac{1}{4}$ to 25 hp. The controller will provide braking



torques said to be eight times full load running torque. Operated from a single start-stop pushbutton, the new controller requires no adjustment after initial installation. *Westinghouse Electric Corp.*

For more data circle No. 45 on postcard, p. 93.



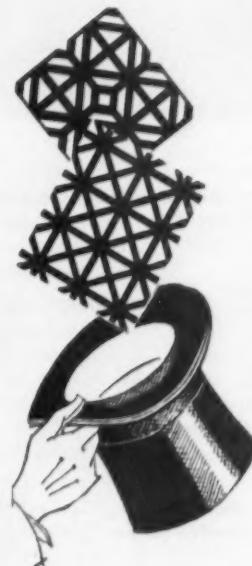
"Dig that! She's the purchasing agent's secretary. Pete's making sure he gets his EXL-DIE® Tool Steel."

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.



adds a magic touch



**Hendrick
Ornametal**
© 1954

More and more metal fabricators are realizing the sales benefits that stem from using Hendrick Ornametal in their product design. Whether you require perforated metal for radiator enclosures, stove panels, kitchen cabinets, clothes and broom closets, lockers or similar applications, you can be certain there's a Hendrick Ornametal design suited for your exact needs.

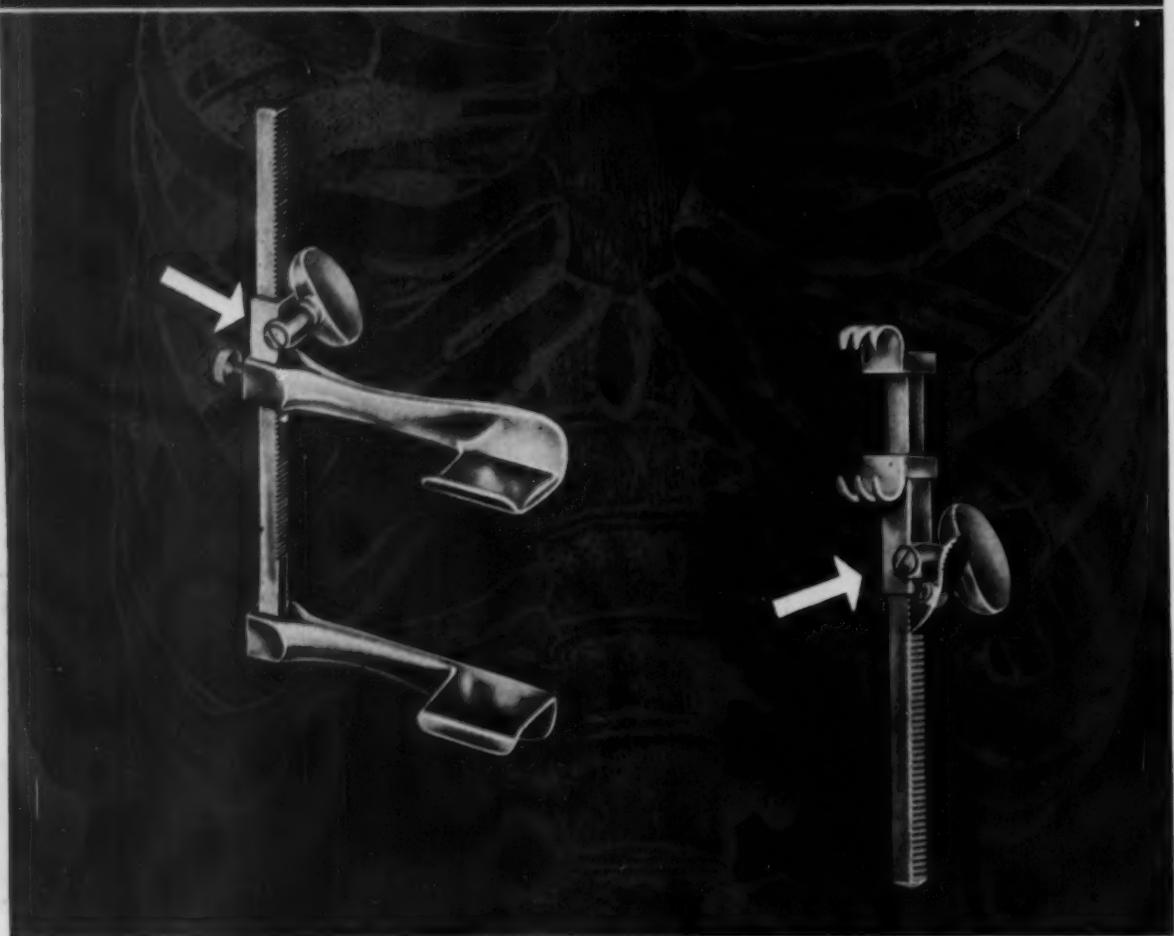
Lightweight and supplied in special bright finish Hendrick Ornametal is made of cold rolled steel suitable for painting or plating. For more complete details, contact Hendrick direct.

Hendrick
MANUFACTURING COMPANY

37 DUNDAFF ST., CARBONDALE, PA. • Sales Offices in Principal Cities
Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armogrids



How to simplify a moving problem



It's a safe bet you've never met these two devices before. On the left is a Tuffier Rib Retractor; on the right, a Bailey Rib Contractor. Both are made by George P. Pilling & Son Co., famed surgical instrument makers of Philadelphia.

The retractor is used by the surgeon to move ribs apart; the contractor to move ribs back to normal position after an operation.

Among the many problems that cropped up in the construction of these instruments was the design of the pinion rod supports (arrows) that slide on the square racks. One solution was to broach a square hole in bar stock, but the cost was high.

Pilling discovered Superior could draw square tubing from type 304 stainless steel to the close I.D. tolerance they required. Superior stainless steel tubing resists corrosion, has no plating to wear off, silver-solders without difficulty.

Superior square tubing is only one of a wide variety of round and shaped tubing made by Superior in up to 55 analyses. And every length or coil of Superior tubing is backed by Superior tubemanship—production and research that make a real difference when you're in a jam. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

Round and Shaped Tubing Available in Carbon, Alloy, and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium.



West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif., Klymond 3-1331

Superior
THE BIG NAME IN SMALL TUBING
All analyses .010" to $\frac{1}{2}$ " O.D.
Certain analyses in Light Walls up to $2\frac{1}{2}$ "

The Iron Age SUMMARY...

Steel industry producing at annual rate of 107 million tons, compared to 87.3 million last year... Operating at peacetime capacity.

Production... The steel industry is now producing at an annual rate of 107 million net tons per year, compared to 87.3 million tons actually produced in 1954.

Steelmaking operations this week are scheduled at 84.0 pct of rated capacity, up 1 point from last week's revised rate. Still higher rates may be anticipated. Within the next few weeks the steelmaking rate is expected to pass 85 pct of rated capacity.

Significance... But it should not be forgotten that about a fifth of official rated capacity is being carried as a defense reserve. So the steel industry is really operating at 100 pct or more of its peacetime capacity.

In many instances the defense reserve capacity would have been scrapped if the government had not asked steel companies to keep it standing so that it could be used in event of war or extreme emergency. Much of this reserve capacity is old or inefficient. And steel companies will employ it only when demand becomes so strong they are compelled to bring it back into production.

It is admittedly difficult to draw an exact line through the industry's capacity and say that all to the left of it is marginal reserve. But a careful check of industry sources by THE IRON AGE

places the marginal capacity conservatively at 15 to 20 million or more net tons. The industry's official capacity this year is rated at 125.8 million net tons.

Gray Market... Evidence of steel gray market activity continues to accumulate. THE IRON AGE has confirmed gray market reports from Pittsburgh, Cleveland, and Chicago, as "fast buck" brokers attempt to capitalize on the very tight market for flat-rolled steel. Products affected are cold-rolled sheets, galvanized sheets, and enameling sheets.

In Pittsburgh unusual sources are in the market buying up sheets of secondary quality at reduced prices and offering them for sale at about \$10 per ton above mill price for sheets of prime quality.

Similar offers are being made in Cleveland, where small consumers are reported disposing of "excess" stocks at a profit. In Chicago office-in-their-hat operators are attempting to buy coils at warehouse level.

Reports from Detroit indicate automakers are planning still higher production schedules for second quarter. This will put even greater pressure on the market for flat-rolled steel products during the next few months.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week†	Last Week	Month Ago	Year Ago
Ingot Index (1947-49=100)	126.2	125.0	115.2	112.2
Operating Rates				
Chicago	85.5	85.0	81.0	84.0
Pittsburgh	81.0	80.0*	74.0	88.0
Philadelphia	76.0	75.0	65.0	78.0
Valley	84.0	83.0*	68.0	74.0
West	90.0	89.5	78.5	76.5
Detroit	90.0	99.0	91.0	83.0
Buffalo	100.0	100.0	100.0	71.0
Cleveland	81.5	80.5	84.0	74.0
Birmingham	74.0	74.0	62.5	87.0
S. Ohio River	95.5	93.0	86.0	76.0
Wheeling	97.0	101.0*	85.0	74.0
St. Louis	87.5	87.5	78.0	48.0
Northeast	55.5	73.5	46.0	59.0
Aggregate	84.0	83.0	77.5	74.0

*Revised. †Tentative

Prices At A Glance

(cents per lb unless otherwise noted)				
	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.797	4.797	4.797	4.634
Pig Iron (gross ton)	\$56.59	\$56.59	\$56.59	\$56.59
Scrap, No. 1 hvy (gross ton)	\$35.50	\$34.50	\$32.83	\$27.67
Nonferrous				
Aluminum, ingot	23.20	23.20	22.20	21.50
Copper, electrolytic	30.00	30.00	30.00	29.75
Lead, St. Louis	14.80	14.80	14.80	12.80
Magnesium, ingot	27.75	27.75	27.75	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	88.00	86.75	87.125	84.75
Zinc, E. St. Louis	11.50	11.50	11.50	9.50

Mild Gray Market Spreads

Warehouses report offers of seconds in galvanized, enameling sheets at \$5 over mill . . . Brokers seek rejects, wasters . . . See continued auto ordering in second quarter.

* ADDITIONAL evidence of a mild gray market in cold-rolled sheets and galvanized sheets has cropped up in Cleveland. The tight market in these two products has encouraged so-called steel brokers to round up tonnages of rejects, wasters and waste wasters and go into business.

A small warehouse, unable to obtain direct mill delivery, says he has received offers of secondary material at prime mill price, upgraded to make the net price \$5 over the mill on galvanized. Some small consumers are said to be disposing of excess stocks at a profit. The premium runs as high as \$10 over the mill price.

Most of the offers are coming from the Pittsburgh area.

Chicago also has learned that some office-in-their-hat operators are trying to buy coils at the warehouse level for resale, without too much luck. The warehouses are hanging onto what they have.

Indications are also that a shortage of enameling sheets may force some appliance makers to get what they can from other-than-usual sources. One plant barely managed to avert a slowdown by rounding up enameling sheets from warehouses and borrowing from sympathetic competitors.

An encouraging report from Detroit is that automobile production in second quarter actually will be stepped up over first quarter levels, minimizing fears of steel producers that automotive orders for second quarter delivery might be canceled.

SHEETS AND STRIP . . . For all practical purposes cold-rolled sheets are solid through first half although order books show some open spaces. Hot-rolled is moving up fast; a Pitts-

burgh mill reports 3-6 week deliveries. Both hot and cold-rolled strip are shaping up better. In Cleveland it's 3-5 weeks on cold-rolled, 8 weeks on hot-rolled. In Chicago cold-rolled strip is 6-10 weeks, hot rolled 4-6 weeks. Strip producers look for a good first half.

GALVANIZED SHEETS . . . No sign of a let-up. First half looks solid. An eastern mill has booked continuous into third quarter, hot dip through April.

STAINLESS . . . Flat-rolled is being booked into second quarter with strong support from automotive and some help from a broad cross-section of other consuming industries. But producers are fighting for business in bars and tubular products.

ELECTRICAL SHEETS . . . Demand is strong. Market is supported by consumer durables and better business with transformer manufacturers.

TOOL STEEL . . . Market has improved slightly during last month but still no better than 55-60 pct of capacity at the plant of a major producer.

BARS . . . Producers are still looking for that extra push from automotive and warehouses. Meanwhile the market is easy from standpoint of delivery promises. Some ware-

houses are still loaded with inventory and auto producers have not stepped up demand as much as expected. Use of castings by car companies has made inroads into bar consumption.

PLATES . . . Slight improvement in some districts. Chicago reports a mild advance with car builders and construction returning to the market. West Coast mills are booked into February. Little or no improvement in the East.

STRUCTURALS . . . Market still suffering from inventory correction and slowdown in construction. Slight improvement in Chicago, with help from highway jobs and probably car builders on light shapes.

TIN PLATE . . . Demand is improving steadily. At least one mill is operating at practical capacity.

PIPE AND TUBING . . . Producers of oil country goods are operating at high level, some at 100 pct of capacity. This is due largely to inventory build-up for stocking of "in-transit" river terminal space due to altered competitive situation in this product. Linepipe is slow but could pick up sharply in near future. Merchant pipe market continues good. An Eastern mill reports orders are up 35 pct in January over November-December. A Pittsburgh mill is operating at 85 pct of capacity. Mechanical and pressure tubing market only fair.

WIRE . . . 1955 looks like a big year for wire producers. The farm market is beginning to shake off seasonal hibernation and merchant wire demand is improving in Midwest. If experience of a major producer is any criterion, construction products should have a record year. This mill reports that orders for wire pavement mesh already exceed entire '54 demand; concrete pipe and construction mesh will be better than 1954. Demand for manufacturers wire continues strong.

PIG IRON . . . Improved demand from foundries producing ingot molds, agricultural and automotive castings has enabled Pittsburgh Coke & Chemical Co. to relight a blast furnace that had been idle since last April. Construction boom also is keeping foundries producing plumbing and heating equipment busy contrary to usual seasonal experience. Jobbing foundries have not yet shared in the upturn.

Purchasing Agent's Checklist

STEEL: Use oxygen to boost open-hearth output . . .	p. 31
ECONOMY: Ike predicts a good year ahead . . .	p. 33
URANIUM: The boom is here to stay . . .	p. 34
MANGANESE: May find practical recovery method soon . . .	p. 38

Eastern Sales Firm Market

A large purchase in Philadelphia district in firm Eastern markets moved composite up \$1 . . . Little activity in Midwest but prices remain steady.

♦ A LARGE TONNAGE purchase of No. 1 steel by a major consumer outside the Philadelphia district in a market already firmed by considerable export business served to move the price of openhearth grades \$2 to \$3 higher in that center.

As a result THE IRON AGE Heavy Melting Steel Scrap Composite rose \$1 this week to \$35.50 per gross ton.

Midwest was noticeably quiet as the month neared its end, but most prices remained stable. Most trade sources expect there will be a pickup in activity in February.

Pittsburgh . . . Brokers are finding it increasingly difficult to fill latest order for openhearth grades at contract price. This situation tends to strengthen the market despite lack of new business.

A large consumer is expected to make a purchase soon for next month's requirements. Blast furnace and cast grades are stronger. No. 1 railroad price is adjusted downward to conform with latest railroad list.

Chicago . . . With volume continuing slow, scrap was beginning to move at the bottom of THE IRON AGE spread to consumers in the area though tonnages seemed to be limited. Cast carried last week's prices and continued in strength, though the remainder of the market was indicating some weakness. Though dealers' prices indicated some mild downward slipping, this was not widespread at press time. Electric furnace turnings and steelmaking grades continued to move at going prices, though movement was beginning at \$1 less on No. 2 heavy, No. 1 industrial heavy and No. 1 industrial bundles, this had the effect of cutting quotations on No. 2 heavy and No. 1 RR heavy. Most trade sources expect a pickup in buying activity will come early in February.

Philadelphia . . . A large purchase of No. 1 heavy melting steel by a major consumer moved the price of that grade up by \$3. No. 2 steel and bundles moved up \$2 in sympathy. Low phosphorus grades also moved up \$1. Cast grades held firm, with \$1 increases in the price of heavy breakable and No. 1 machinery cast. Reports indicated that export business is going strong with orders being filled at previous prices.

Cleveland . . . A Valley purchase of No. 1 heavy melting steel confirmed present price of \$37. Otherwise there was little activity either in Cleveland or Youngstown. Reports are that a purchase of blast furnace material at a somewhat higher price has been hanging fire.

Buffalo . . . The cast prices broke \$1 a ton here with local and Canadian buying reported within a range of \$36.00-\$37.00 for cupola. Both sides played a waiting game in steel grades. Uncertainties are apparent over prices, as mills withheld bids tending to placement of new orders which are expected next week. Buffalo steel rate unchanged holding at the 100 mark.

Detroit . . . Purchasing from local mills was at a very low ebb as the month ended but outside consumers were in the market strong enough to edge a few prices upward here and there. The local trade is encouraged by the mild winter which should indicate an early opening of navigation. This cuts shipping rates considerably and encourages purchases from other Lake ports.

St. Louis . . . A steady flow of scrap of sufficient volume to meet the requirements of consumers continues to reach the St. Louis industrial district with no shortages in sight, unless seasonal conditions should halt the movement or the mill's production should rise sharply. Two RR

lists sold during the week at present prices. Prices are unchanged from last week's levels.

Boston . . . Bit of firm undertone set in in last few days, for a change. While prices are local and export prices, Pittsburgh and Eastern Pennsylvania are paying a bit higher for all these items.

New York . . . Prices of steelmaking scrap rose from \$1.50 to \$2 in response to large purchase of No. 1 steel and resulting price increase in Philadelphia. There were no reports of out-of-district buying at press time that would reflect more than \$30 per gross ton for No. 1 heavy melting steel.

Birmingham . . . The steel scrap market was active and strong this week with an increase in export demand. Mills, however, showed no inclination to increase prices to meet export competition. Two ships are now loading in Florida and it is reported another will arrive next month. The cast market is strong and supplies are spotty. Some yards report cast coming in satisfactorily while others say the supply is skimpy. Despite the tightening of supplies, Foundries refuse to increase offers in view of the narrow spread between cast and pig iron.

Cincinnati . . . Increased production schedules of a district mill have failed to generate new business of any significance. Brokers feel that consumers will have to make a purchase of openhearth grades soon. Meanwhile, the market is dull pending bids on an industrial list and the usual monthly scrap purchase of another area consumer.

West Coast . . . Scrap export activity is gravitating toward the San Francisco Bay area and the outlook is for still more shipping in February and March. Lower scrap prices in San Francisco make it an attractive shipping point. Los Angeles is holding its own in the export trade. Seattle and Los Angeles prices unchanged. Although supplies in the San Francisco market are adequate now, this could change if the export business continues strong. Dealers in Los Angeles are concerned that one mill may reduce its scrap requirements with the refiring of a blast furnace down two months for repairs. Softer tone to cast iron market in Los Angeles but price is holding at \$42-\$43 a ton.

How to reduce your costs with surface finish control



"**Eliminates arguments** on surface finish," says Sterling Engine Company, "thus we have realized definite dollar savings with the SURFINDICATOR". This company uses the instrument to check finish on precision parts where a microinch finish is specified. Delays on inspection questions are eliminated.

SURFINDICATOR* SAVES INSPECTION TIME

WITH SURFACE FINISH CONTROL you can reduce your production costs—speed inspection, eliminate costly over-finishing, end guesswork. And you don't have to invest in costly laboratory equipment to realize these benefits.

The SURFINDICATOR was designed for you to use on the production line. It can be quickly set up—operated by anyone. It is a precision instrument that can be calibrated on the job, yet is priced within the range of even the small-volume shop. In case after case the SURFINDICATOR has quickly paid for itself through economies in production. Send coupon now for complete information.

*Trade-Mark



Surfindicator used to check surface finish on blades. The instrument allows a positive reading to meet specifications, as opposed to a visual inspection possible only with trained personnel.

Brush Electronics Company, Dept. S-1
3405 Perkins Avenue, Cleveland 14, Ohio

- Please send free copy of "Surface Finish Control".
 Have your nearest representative demonstrate the SURFINDICATOR to me.

Name _____

Position _____

Company _____

Address _____

City _____ State _____

BRUSH ELECTRONICS

INDUSTRIAL AND RESEARCH INSTRUMENTS
PIERO-ELECTRIC MATERIALS • ACOUSTIC DEVICES
MAGNETIC RECORDING EQUIPMENT
ULTRASONIC EQUIPMENT



COMPANY

formerly
The Brush Development Co.
Brush Electronics Company
is an operating unit of
Clevite Corporation.

Scrap Prices (Effective Jan. 25, 1965)

Pittsburgh

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	32.00 to 34.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	36.00 to 39.00
Machine shop turn.	18.50 to 19.50
Mixed bar, ms. turns.	18.50 to 19.50
Shoveling turnings	22.50 to 23.50
Cast iron borings	22.50 to 23.50
Low phos. punch'gs, plate	40.00 to 41.00
Heavy turnings	33.00 to 34.00
No. 1 RR. hvy. melting	38.00 to 39.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	48.00 to 49.00
RR. steel wheels	41.50 to 42.50
RR. spring steel	41.50 to 42.50
RR. couplers and knuckles	41.50 to 42.50
No. 1 machinery cast.	43.00 to 44.00
Cupola cast	38.00 to 39.00
Heavy breakable cast	34.00 to 35.00

Chicago

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 factory bundles	36.00 to 37.00
No. 1 dealers' bundles	34.00 to 35.00
No. 2 dealers' bundles	24.00 to 25.00
Machine shop turn.	16.00 to 18.00
Mixed bar. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	39.00 to 40.00
Low phos. punch'gs, plate	37.00 to 38.00
Low phos. 3 ft and under	36.00 to 37.00
No. 1 RR. hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	52.00 to 53.00
Rails 2 ft and under	49.00 to 50.00
Locomotive tires, cut	36.00 to 37.00
Cut bolsters & side frames	37.00 to 38.00
Angles and splice bars	43.00 to 44.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	35.00 to 39.00
No. 1 machinery cast.	44.00 to 46.00
Cupola cast	40.00 to 41.00
Heavy breakable cast	32.00 to 33.00
Cast iron brake shoes	33.00 to 34.00
Cast iron car wheels	35.00 to 36.00
Malleable	44.00 to 45.00
Stove plate	33.00 to 35.00

Philadelphia Area

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	26.50 to 28.00
Machine shop turn.	19.00 to 20.00
Mixed bar, short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 5 ft and under	34.50 to 35.00
Low phos. 2 ft and under	34.50 to 35.00
Low phos. punch'gs	34.50 to 35.00
Elec. furnace bundles	35.00 to 36.00
Heavy turnings	32.00 to 33.00
RR. steel wheels	35.50 to 36.50
RR. spring steel	36.00 to 37.00
Rails 18 in. and under	49.00 to 50.00
Cupola cast	34.00 to 35.00
Heavy breakable cast	36.00 to 37.00
Cast iron car wheels	41.00 to 42.00
Malleable	41.00 to 42.00
Unstripped motor blocks	27.00 to 28.00
No. 1 machinery cast.	43.00 to 44.00
Charging box cast.	35.00 to 36.00

Cleveland

No. 1 hvy. melting	\$33.50 to \$24.50
No. 2 hvy. melting	36.00 to 31.00
No. 1 bundles	33.50 to 34.50
No. 2 bundles	27.00 to 28.00
No. 1 busheling	33.50 to 34.50
Machine shop turn.	15.00 to 16.00
Mixed bar. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Cut struct'r'l & plates, 3 ft & under	27.00 to 28.00
Drop forge flashings	33.00 to 34.00
Low phos. punch'gs, plate	33.50 to 34.50
Foundry steel, 2 ft & under	36.50 to 37.50
No. 1 RR. heavy melting	34.00 to 35.00
Rails 2 ft and under	47.00 to 48.00
Rails 18 in. and under	49.00 to 50.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	45.00
No. 1 machinery cast.	44.00 to 45.00
Stove plate	38.00 to 39.00
Malleable	44.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$26.00 to \$27.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	27.50 to 28.50
Machine shop turn.	19.00 to 20.00
Shoveling turnings	22.00 to 23.50
Cast iron borings	22.00 to 23.50
Low phos. plate	36.00 to 37.00

Buffalo

No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	25.50 to 26.50
No. 1 busheling	30.00 to 31.00
No. 1 bundles	30.00 to 31.00
No. 2 bundles	23.50 to 24.50
Machine shop turn.	18.00 to 19.00
Mixed bar. and turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.00 to 21.00
Low phos. plate	32.50 to 34.50
Scrap rails, random lgth.	35.00 to 36.00
Rails 2 ft and under	42.00 to 43.00
RR. steel wheels	36.00 to 37.00
RR. spring steel	36.00 to 37.00
RR. couplers and knuckles	36.00 to 37.00
No. 1 machinery cast.	41.00 to 42.00
No. 1 cupola cast.	36.00 to 37.00

Detroit

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 bundles, openhearth	27.00 to 28.00
No. 2 bundles	18.00 to 19.00
New busheling	26.00 to 27.00
Drop forge flashings	26.00 to 27.00
Machine shop turn.	11.00 to 12.00
Mixed bar. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos. punch'gs, plate	28.00 to 29.00
No. 1 cupola cast.	34.00
Heavy breakable cast	25.00
Stove plate	30.00
Automotive cast.	38.00

St. Louis

No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	16.00 to 17.00
Mixed bar. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. & under	36.00 to 37.00
Rails, random lengths	38.00 to 39.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	26.50 to 27.50
No. 2 bundles	22.50 to 23.50
Machine shop turn.	10.00 to 11.00
Mixed bar. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean cast chem. borings	22.00 to 23.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	28.00 to 29.00
Unstripped motor blocks.	22.00 to 23.00

Birmingham

No. 1 hvy. melting	\$28.00 to \$29.00
*No. 2 hvy. melting	24.00 to 25.00
No. 1 bundles	28.00 to 29.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	23.00 to 24.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	29.00 to 30.00
Bar crops and plate	33.00 to 34.00
Structural and plate, 3 ft.	32.00 to 34.00
No. 1 RR. hvy. melting	32.00 to 33.00
Scrap rails, random lgth.	37.00 to 38.00
Rails, 18 in. and under	41.00 to 42.00
Angles & splice bars	38.00 to 39.00
Rerolling rails	42.00 to 42.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	42.00 to 43.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	32.00 to 34.00
Unstripped motor blocks.	35.50 to 36.50
Mashed tin cans	15.00 to 16.00

*Price quoted in effect Dec. 2, 1954 to date.

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$31.00 to \$32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	31.00 to 32.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	16.00 to 17.00
Mixed bar. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. & under	36.00 to 37.00
Rails, random lengths	38.00 to 39.00
Rails, 18 in. and under	46.00 to 47.00
No. 1 cupola cast.	39.00 to 40.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	44.00 to 45.00

San Francisco

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	18.00
No. 3 bundles	14.00
Machine shop turn.	6.00
Cast iron borings	9.00
No. 1 RR. hvy. melting	24.00
No. 1 cupola cast.	40.00

Los Angeles

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	24.00
No. 1 bundles	27.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn.	8.00
Shoveling turnings	10.00
Cast iron borings	10.00
Elec. furn. 1 ft. and under.	28.00
No. 1 RR. hvy. melting	22.00
No. 1 cupola cast.	43.00

Seattle

No. 1 hvy. melting	\$29.00
No. 2 hvy. melting	25.00
No. 1 bundles	31.00
No. 2 bundles	21.00
No. 3 bundles	18.00
No. 1 cupola cast.	35.00
Mixed yard cast	35.00

Hamilton, Ont.

No. 1 hvy. melting	\$28.00
No. 2 hvy. melting	25.00
No. 1 bundles	28.00
No. 2 bundles	22.00
Mixed steel scrap	22.00
Bushelings	23.00
Bush., new fact prep'd	26.00
Bush., new fact unprep'd	22.00
Short steel turnings	12.00
Mixed bar. and turn.	12.00
Rails, rerolling	37.00
Cast scrap	42.00 to 45.00

A
SYMBOL
OF
LEADERSHIP
IN
IRON & STEEL
SCRAP
SINCE
1889



Luria Brothers and Company, Inc.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.

Philadelphia 7, Penna.

PLANTS

LEBANON, PENNA. DETROIT (ECORSE),
READING, PENNA. MICHIGAN
MODENA, PENNA. PITTSBURGH, PENNA.
ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA.	DETROIT, MICHIGAN	PITTSBURGH, PENNA.
BOSTON, MASS.	HOUSTON, TEXAS	PUEBLO, COLORADO
BUFFALO, N. Y.	LEBANON, PENNA.	READING, PENNA.
CHICAGO, ILLINOIS	LOS ANGELES, CAL.	ST. LOUIS, MO.
CLEVELAND, OHIO	NEW YORK, N. Y.	SANFRANCISCO, CAL.
	SEATTLE, WASH.	

EXPORTS - IMPORTS — LIVINGSTON & SOUTHDARD, INC., 99 Park Avenue, New York, N. Y. Cable Address: FORENTRACO

January 27, 1955

113

Copper Price Pressure Mounts

High demand, short supply, higher European prices put squeeze on U. S. copper producers . . . Chile threatens to sell elsewhere . . . Dam may break—By R. L. Hirschek.

◆ PRICES continue to lead off the nonferrous news as copper shows signs of following the recent increase made in aluminum. Pressure for a copper increase is steadily building to higher levels. All of the factors are there: high demand, short supply, reduced mine production in Northern Rhodesia, furnace troubles in the U. S., and Chile threatening to take its copper elsewhere for more money.

Domestic producers have really made strenuous efforts in the past 2 years to maintain stability. This stability itself has tended to even out the peaks and valleys of consumer buying. Another major consideration has been competition from other metals, notably aluminum, which has just completed its price increase.

COPPER . . . The remarkable stability exhibited by domestic copper prices since the Office of Price Stabilization lid came off nearly 2 years ago is being subjected to a severe test—and the trade isn't at all sure that the dam won't break, at least partially.

There's no question about market demand. It's hot. And U. S. held refined copper stocks are really quite low, as it's estimated there is now less than a 2-week supply.

Mines in Northern Rhodesia are still plagued by labor trouble and only partial production is possible. Chile, always looking for a higher price, has threatened to sell in Europe where quotations are considerably higher

than in the U. S. To top it all off, American Smelting & Refining is having production difficulty at its El Paso smelter which may take another month to straighten out. Production won't be lost, only delayed.

Possible help for copper consumers could come from the government. But it wouldn't unless they were actually faced with a shortage-caused shutdown. And even then, remember that government "inventories" were pared some 40,000 lb late last year for the same purpose. There may not be enough left in these "inventories." Removal of metal from the strategic stockpile, of course, would require a Presidential okay and this could run into roadblocks.

What could tip the price balance would be fulfillment of Chile's threat to divert copper from U. S. markets. But how much would it rise? Probably not to the 37¢ and more being paid in Europe. Members of the trade are guessing the price may go up to about 32.5¢.

ALUMINUM . . . Fabricating plans of the nation's No. 4 aluminum producer were revealed last week when American Brass Co. announced it will build a \$25 million aluminum fabricating plant at Terre Haute, Ind. Firm is a subsidiary of Anaconda Copper Mining Co. which is currently nearing completion of an aluminum reduction plant at Columbia Falls, Mont. Completion of the reduction plant is scheduled for about mid-1955 and eventual capacity will be about 60,000 tons annually.

American Brass, which has been

rolling small quantities of aluminum at Torrington, Conn., and Anaconda Wire & Cable Co. will obtain their aluminum from the Anaconda Aluminum subsidiary.

Aluminum Import Corp., which sells Canadian metal in the U. S., last week raised its prices to meet the recent increases by domestic producers. This puts Aluminum Co. of Canada in the position of having started and finished the round. Alcan led off first by raising prices 0.75¢ per lb in all markets with the single exception of the United States.

ZINC . . . General Services Administration last week finally sent out its requests for January stockpile zinc. And the already firm zinc market firmed up a bit more as buyers lost their reticence and mounted the bandwagon. Some sellers attributed the consumer spurt to GSA's entry into the market.

Special High Grade continues to be the hottest item in the market, primarily because of tremendous demand from the auto industry for diecastings. Prime Western is doing well—but not as well as the torrid demand for galvanized steel would indicate. This is at least partially explained by the trend toward continuous galvanizing and the fact that demand is hottest for the continuous product.

Steel firms use grades higher than Prime Western for this purpose but the industry still hasn't settled down into a final pattern. It almost seems that no two mills are using the same analysis, some adding metals that other steel mills wouldn't take on a bet.

LEAD . . . At the same time GSA wired zinc producers, the agency also contacted lead producers for January stockpile requirements. Indications are that sellers offered about the same quantity as in previous months, namely some 10,000 tons.

Sales to private consumers last week were about double the previous week and the market continues firm with trading at fair levels.

TIN . . . It's noteworthy that President Eisenhower's fiscal '56 budget makes no provision for continuation of operations at the Texas City smelter. The President felt the same way last year but was overruled by Congress. Congress is again studying the picture and a report on the Texas City smelter may be out by Mar. 16.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Jan. 19	Jan. 20	Jan. 21	Jan. 22	Jan. 24	Jan. 25
Copper, electro, Conn.	30.00	30.00	30.00	30.00	30.00	30.00
Copper, Lake, delivered	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York	86.375	87.00	86.875	—	88.00	88.00*
Zinc, East St. Louis	11.50	11.50	11.50	11.50	11.50	11.50
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices

*Tentative



COPPER DETERMINATION

Alloymet 2030

(65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical **CONTROL**
for the production of low alloy steel and gray iron

Pre-alloyed master alloys are leaving an indelible mark
on the iron and steel industry. The element of human error
is reduced many fold, since a single alloying agent,
ALLOYMET 2030 ingot or shot, can replace many separate
inoculants. A single trial of Alloymet 2030 or its companion
alloys will make you an "Alloymet regular."

For further information, write us for
our booklet, "Master Alloys." 

*Nominal Chemical Composition

ALTER

Alloy Metal Division

C O M P A N Y 1701 Rockingham Road, DAVENPORT, IOWA

Phone 6-2561 Teletype DV 588

Nonferrous Prices (Effective Jan. 28, 1955)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

	Flat Sheet	Plate	
Alley	0.032 in.	0.136 in.	0.250 in.
	0.061 in.	0.249 in.	3.000 in.
1100, 3003.....	39.1	37.1	35.9
2004.....	44.0	39.8	38.1
5052.....	46.7	41.9	40.2
2024-O, -OAL.....	49.4	40.8	39.3
7075-O, -OAL.....	50.8	49.1	46.8

Extruded Solid Shapes: Shape factors 1 to 6, 35.7¢ to 36.7¢; 12 to 14, 39.4¢ to 41.0¢; 24 to 26, 42.2¢ to 51.3¢; 36 to 38, 45.4¢ to 51.9¢. Rod, Round: Rolled, 1.064-4.5 in., 1100-F, 45.6¢ to 46.1¢; cold finished, 0.978-8.499 in., 1100-F, 47.5¢ to 42.4¢.

Screw Machine Stock: Rounds, 2011-T8, 5¢-11/32 in., 63.8¢ to 50.1¢; 5¢-13/32 in., 49.5¢ to 46.9¢; 19/16-3 in., 45.7¢ to 42.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.074 in., 1100, 47.1¢ to 52.8¢; 5052, 50.7¢ to 44.4¢; 2017-T4, 64.3¢ to 44.7¢; 6061-T4, 50.5¢ to 44.1¢.

Extruded Tubing: Rounds, 6063-T8, OD 1 1/2 in., 44.4¢ to 64.8¢; 2-1/4 in., 40.3¢ to 54.6¢; 4-6 in., 40.8¢ to 49.8¢; 6-9 in., 41.4¢ to 52.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42¢; x 50-in., \$2.998; x 36-in., \$4.801; x 120-in., \$6.002; x 144-in., \$7.202. Coiled sheet, per lb, 0.019 in. x 38 in., \$0.94.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: F81-O 1/4 in., 56¢; 3/16 in., 67¢; 1/8 in., 69¢; 0.064 in., 72¢; 6.032 in., 94¢. Specification grade higher. Base 50,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 5/16 to 1/2 in., 80.5¢; 1/2 to 1.760 in., 84¢; 2 1/2 to 5 in., 85.8¢. Other alloys higher. Base up to 5/16 in. diam, 10,000 lb.; 5/16 to 3 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M, in weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 63.8¢; 0.23 to 0.25 lb, 5.9 in., 62.8¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.85 lb, 10.8 in., 68.8¢; 4 to 6 lb, 28 in., 62¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 in., 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 50,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD 3/4 to 5/16 in., \$1.43; 5/16 to 5/8 in., \$1.29; 5/8 to 7/8 in., 94¢; 1 to 2 in., 79¢; 0.165 to 0.210 in. wall; OD, 5/8 to 1 1/2 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 69¢. Other alloys higher. Base, Higher. OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 8 in., 20,000 lb; over 8 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$11; Bar, HR or forged, \$9; Forgings, \$9.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

"A" Nickel Monel Inconel

Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube, 132	108	153	
Shot, Blocks	...	65	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Shapes
Copper	46.79	...	48.86
Copper, h-r	48.76	45.11	
Copper, drawn	46.36		
Low brass	44.95	44.89	
Yellow brass	42.27	42.21	
Red brass	45.89	45.83	
Naval brass	46.39	40.70	41.96
Leaded brass	46.39		39.73
Com. bronze	47.28	47.22	
Mang. bronze	50.11	44.25	46.81
Phos. bronze	67.31	67.31	
Munts metal	46.56	40.85	41.60
Ni silver, 10 pct	56.30		63.80
Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.			
Strip			\$1.68
Rod, bar, wire			1.68

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	32.20
Aluminum pig	21.50
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, per lb conta'd be, \$40.00	
Beryllium aluminum 5% Be, Dollars per lb contained Be	\$72.75
Bismuth, ton lots	52.25
Cadmium, del'd	51.70
Cobalt, 97-99% (per lb)	\$2.00 to \$2.67
Copper, electro, Conn. Valley	30.00
Copper, Lake, delivered	30.00
Gold, U. S. Tress, per troy oz.	\$25.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$120
Lead, St. Louis	14.50
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	27.00
Magnesium, sticks, 100 to 500 lb, freight allowed	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	\$322 to \$324
Nickel electro, f.o.b. N. Y. warehouse	67.50
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	\$18 to \$20
Platinum, dollars per troy oz.	\$82 to \$84
Silver, New York, cents per troy oz.	85.25
Tin, New York	88.00
Titanium, sponge, grade A-1	54.50
Zinc, East St. Louis	11.50
Zinc, New York	12.00
Zirconium copper, 50 pot	\$6.30

REMETALLED METALS

Bronze Ingot

(Cents per lb delivered, carloads)

85-5-5-5 Ingot	31.50
No. 115	31.00
No. 120	30.50
No. 123	30.50
85-16-10 Ingot	35.50
No. 305	35.50
No. 310	32.25
85-10-2 Ingot	44.25
No. 210	47.75
No. 215	36.25
No. 245	27.25
Yellow Ingot	27.25
No. 405	29.25
Manganese bronze	29.25
No. 421	29.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-6-aluminum-silicon alloys	25.25-26.00
0.30 copper, max.	25.00-25.75
0.60 copper, max.	25.00-25.75
Piston alloys (No. 122 type)	23.50-25.00
No. 12, Alum. (No. 3 grade)	23.00-24.00
108 alloy	23.50-24.50
195 alloy	24.50-25.50
13 alloy (0.60 copper max.)	25.00-25.75
ASX-670	23.50-24.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97 1/2%	25.00-26.00
Grade 2—92-96%	24.00-25.00
Grade 3—90-92%	23.00-24.00
Grade 4—85-90%	22.25-23.00

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	Cast, oval, 15 in. or longer	44.50
	Electrodeposited	39.75
	Flat rolled	46.42
Brass, 80-20		
	Cast, oval, 15 in. or longer	43.515
	Zinc, flat cast	20.25
	Ball, anodes	18.50
Nickel, 99 pct plus		
	Cast	88.50
	Cadmium	\$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.		94%
Chemicals		
Copper cyanide, 100 lb drum	63.00	
Copper sulphate, 99.5 crystals, bbl.	13.85	
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20.00	
Nickel chloride, 375 lb drum	38.00	
Silver cyanide, 100 oz. lots, per oz.	75 1/2	
Sodium cyanide, 98 pct domestic 200 lb drums	18.25	
Zinc cyanide, 100 lb drum	54.30	

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

Copper	26	25 1/2
Yellow brass	19 1/2	18 1/2
Red brass	23	22 1/2
Comm. bronze	23 1/2	23 1/2
Mang. bronze	18 1/2	17 1/2
Yellow brass rod ends	19 1/2	

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	30 1/2	30 1/2
No. 2 copper wire	28	28
Light copper	27 1/2	27 1/2
No. 1 composition	24 1/2	24 1/2
No. 1 comp. turnings	24 1/2	24 1/2
Rolled brass	20	20
Brass pipe	20	20
Radiators	20 1/2	20 1/2

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

(No. 1 heavy copper and wire, 27 1/2—28)

No. 1 heavy copper and wire	27 1/2	28
No. 2 heavy copper and wire	26	26 1/2
Light copper	24	24 1/2
New type shell cuttings	24	24 1/2
Auto radiators (unwanted)	18	18

Aluminum

(Alum. pistons and struts, 8 1/2—9 1/2)

Alum. pistons and struts	8 1/2	9 1/2
Alum. crankcases	11	12
1100 (28) aluminum clippings	14 1/2	15 1/2
Old sheet and utensils	11	12
Borings and turnings	7 1/2	8 1/2

Zinc

(New zinc clippings, 7)

Old zinc	5 1/2
Zinc routings	3 1/2
Old die cast scrap	3 1/2

Nickel and Monel

(Pure nickel clippings, 57)

Clean nickel turnings	40
Nickel rod ends	57
New Monel turnings	28
Clean Monel turnings	21
Old sheet Monel	26
Nickel silver clippings, mixed	16 1/2
Nickel silver turnings, mixed	13 1/2

Magnesium

(Segregated solids, 18 1/2—19)

Castings	17 1/2	18
Block tin	70	75

Miscellaneous

(No. 1 powder, 50—55)

No. 1 auto babbitt	45

<tbl_r cells="2

IRON AGE STEEL PRICES (Effective Jan. 25, 1955)			Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.											
			BILLETS, BLOOMS, SLABS			PIL- ING	SHAPES STRUCTURALS			STRIP				
	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hat- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled	
EAST	Bethlehem, Pa.			\$34.00 B3		4.30 B3	6.45 B3	4.30 B3						
	Buffalo, N. Y.	\$34.00 B3	\$78.00 B3, R3	\$86.00 B3, R3	5.075 B3	4.30 B3	6.45 B3	4.30 B3	4.05 B3,R3	5.75 B3,R7	6.15 B3	8.425 B3		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.10 A2	5.30 A2	6.15 A2			
	New Bedford, Mass.									6.20 R6				
	Johnstown, Pa.	\$34.00 B3	\$78.00 B3	\$86.00 B3		4.30 B3	6.45 B3		4.05 B3					
	Fairless, Pa.													
	New Haven, Conn.									6.20 D1 6.50 A5				
	Phoenixville, Pa.					3.95 P2		3.95 P2						
	Sparrows Pt., Md.								4.05 B3	5.75 B3	6.15 B3	8.425 B3		
	Wallingford, Conn.									6.20 W1				
	Pawtucket, R. I. Worcester, Mass.									6.30 N7 6.60 A5			12.75 A5 12.80 N7	
	Alton, Ill.								4.225 L1					
MIDDLE WEST	Ashland, Ky.								4.05 A7					
	Canton-Massillon, Deer, Ohio		\$30.00 R3	\$86.00 R3, T5									12.45 G4	
	Chicago, Ill.	\$34.00 U1	\$78.00 R3, U1,W8	\$86.00 U1, W8,R3	5.075 U1	4.25 U1, W8	6.40 U1, Y1	4.25 U1	4.05 A1,N4 W9	5.85 A7				
	Cleveland, Ohio									5.75 A5,J3		8.80 A5	12.45 A5	
	Detroit, Mich.			\$86.00 R5					4.15 G1,M2	5.85 D1,D2, G3,M2,P11	6.25 G3	8.70 D2, G3		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$34.00 U1	\$78.00 U1	\$86.00 U1, Y1	5.075 J3	4.25 J3, U1	6.40 U1, J3		4.05 J3, U1,Y1	5.85 J3	6.15 U1, J3,Y1	8.80 Y1	6.70 U1, Y1	
	Sterling, Ill.								4.15 N4					
	Indianapolis, Ind.									8.80 C5				
	Newport, Ky.											6.70 Y5		
	Middletown, Ohio								5.75 A7					
	Niles, Warren, Ohio Sharon, Pa.								4.05 S1,R3	5.75 S1,R3, T4	6.15 S1, R3	8.80 S1, R3	6.70 S1 12.45 S1	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$34.00 U1, J3	\$78.00 J3, U1,C11	\$86.00 U1, C11	5.075 U1	4.25 J3, U1	6.40 J3, U1	4.25 U1	4.05 S7,P6	5.75 B4,J3, S2			6.70 S9 12.45 S9	
WEST	Portsmouth, Ohio								4.05 P7	5.75 P7				
	Wheeling, Follansbee, W. Va.					4.25 W3			4.05 W3	5.75 F3,W3	6.15 W3	8.80 W3		
	Youngstown, Ohio		\$78.00 C10	\$86.00 Y1, C10		4.25 Y1	6.40 Y1		4.05 U1,Y1	5.75 Y1,C5	6.15 U1, Y1	8.80 Y1	6.70 U1, Y1 12.45 C5	
	Fontana, Cal.	\$72.00 K1	\$86.00 K1	\$105.00 K1		4.90 K1	7.05 K1	5.25 K1	4.825 K1	7.45 K1	7.25 K1		8.10 K1 14.55 K1	
	Genoa, Utah		\$78.00 C7			4.25 C7	6.40 C7							
	Kansas City, Mo.					4.30 S2	6.45 S2		4.30 S2		6.40 S2		6.95 S2	
	Los Angeles, Terrace, Cal.		\$87.50 B2	\$106.00 B2		4.95 B2, C7	7.10 B2		4.80 B2,C7	7.80 C7				
	Minneapolis, Colo.					4.70 C6			5.15 C6					
	Portland, Ore.					5.00 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$87.50 B2			4.90 B2 4.95 P9	7.05 B2		4.80 B2,C7					
	Seattle, Wash.		\$91.50 B2			5.00 B2	7.15 B2		5.05 B2, P12					
SOUTH	Atlanta, Ga.								4.15 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$64.00 T2	\$78.00 T2			4.25 C16, R3,T2	6.40 T2		4.05 R3, T2,C16		6.15 T2			
	Houston, Tex.		\$83.00 S2	\$91.00 S2		4.30 S2	6.45 S2		4.30 S2		6.40 S2	6.95 S2		

IRON AGE STEEL PRICES		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE	
(Effective Jan. 25, 1965)		Hot-rolled 18 ga. & heavier	Cold-rolled	Galvanized 16 ga.	Enameling 12 ga.	Long Tone 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.85 B3	4.95 B3				6.10 B3	7.50 B3			4.875 W6			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.10 A2	5.00 A2				6.15 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.875 B3			
	Fairless, Pa.	4.10 U1	5.00 U1				6.15 U1	7.55 U1				\$8.90 U1	\$7.80 U1	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.85 B3	4.95 B3	5.45 B3			6.10 B3	7.50 B3	8.20 B3		4.775 B3	\$8.90 B3	\$7.80 B3	
	Worcester, Mass.										4.975 A5			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										4.85 L1			
	Ashland, Ky.	4.85 A7		5.45 A7	5.375 A7									
	Canton-Massillon, Deer, Ohio			5.45 R1, R3							5.175 R1			
	Chicago, Joliet, Ill.	4.85 A1, W8					6.10 U1				4.875 A5, N4, R3			
	Sterling, Ill.										4.775 N4			
	Cleveland, Ohio	4.85 J3, R3	4.95 J3, R3		5.375 R3		6.10 J3, R3	7.50 J3, R3			4.875 A5			
	Detroit, Mich.	4.15 G3, M2	5.05 G3				6.20 G3	7.60 G3						
	Newport, Ky.	4.85 N5		5.45 N3										
	Gary, Ind. Harbor, Indiana	4.85 J3, U1, Y1	4.95 J3, U1, Y1	5.45 U1, J3	5.375 J3, U1	5.85 U1	6.10 U1, J3, Y1	7.50 U1, Y1			4.875 Y1	\$8.80 J3, U1, Y1	\$7.50 J3, U1, Y1	
	Granite City, Ill.	4.25 G2	5.15 G2	5.85 G2	5.875 G2								\$7.80 G2	
	Kokomo, Ind.	4.15 C9		5.55 C9							5.20 C9	4.775 C9		
	Manahawkin, Ohio					5.85 E2					5.175 E2			
	Middletown, Ohio	4.85 A7		5.375 A7	5.85 A7									
	Niles, Ohio Sharon, Pa.	4.85 S1, R3 5.30 N3	4.95 R3 5.975 N3	5.45 N3	6.725 N3	5.85 N3	6.10 S1, R3	7.50 R3				5.80 R3	\$7.50 R3	
WEST	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 J3, U1, P6	4.95 J3, U1, P6	5.45 U1	5.375 U1		6.10 J3, U1	7.50 J3, U1	8.20 U1		4.875 A5 4.875 P6	\$8.80 J3, U1	\$7.50 J3, U1	
	Portsmouth, Ohio	4.05 P7	4.95 P7								4.875 P7			
	Wheeling, Follansbee, W. Va.	4.05 W3, W3	4.95 W3, W3, F3	5.45 W3, W5		5.85 W3, W5	6.10 W3	7.50 W3				\$8.80 W3, W5	\$7.50 W3, W5	
	Youngstown, Ohio	4.85 U1, Y1	4.95 Y1		5.375 Y1		6.10 U1, Y1	7.50 Y1			4.875 Y1			
	Fontana, Cal.	4.825 K1	4.85 K1				6.875 K1	8.55 K1			5.475 K1			
	Geneva, Utah	4.15 C7												
	Kansas City, Mo.											4.925 S2		
	Los Angeles, Terrance, Cal.											5.475 C7, B2		
	Minneapolis, Colo.											4.925 C6		
	San Francisco, Niles, Pittsburg, Cal.	4.75 C7	5.90 C7	6.20 C7							5.325 C7	5.95 C7	\$8.25 C7	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.85 R1, T2	4.95 T2	5.45 R3, T2			6.10 T2			5.25 R3	4.875 T2, R3	\$8.90 T2	\$7.80 T2	
	Houston, Texas										4.925 S2			

IRON AGE STEEL PRICES (Effective Jan. 25, 1955)		Prices identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
		BARS					PLATES				WIRE	
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Migr. Bright
EAST	Bethlehem, Pa.				5.875 B3	6.825 B3	6.45 B3					
	Buffalo, N. Y.	4.30 B3,R3	4.30 B3,R3	5.85 B5	5.875 B3,R3	6.825 B3,B5	6.45 B3	4.225 B3,R3			6.45 B3	5.75 W6
	Claymont, Del.								4.225 C4			
	Coatesville, Pa.								4.225 L4			
	Conshohocken, Pa.								4.225 A2		6.45 A2	
	Harrisburg, Pa.							3.975 C3	5.875 C3			
	Hartford, Conn.			5.80 R3		6.925 R3						
	Johnstown, Pa.	4.30 B3	4.30 B3		5.875 B3		6.45 B3	4.225 B3		5.80 B3	6.45 B3	5.75 B3
	Fairless, Pa.	4.45 U1	4.45 U1		5.225 L11							
	Newark, N. J.			5.85 W10		6.80 W10						
	Camden, N. J.			5.85 P10								
	Putnam, Conn.			5.95 W10								
	Sparrows Pt., Md.		4.30 B3					4.225 B3		5.80 B3	6.45 B3	5.85 B3
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85 W71 5.95 B5,C14		6.825 A5,B5						6.05 A5, W8
MIDDLE WEST	Altan, Ill.	4.50 L1										5.925 L1
	Ashland, Newport, Ky.							4.225 A7,N3		5.80 N5		
	Canton-Massillon, Mansfield, Ohio	4.40 R3		5.40 R2,R3	5.875 R3,T3	6.825 R2,R3, T3		4.225 E2				
	Chicago, Joliet, Ill.	4.30 U1, N4,W8,R3	4.30 N4,R3	5.40 A5,W10, W8,B5,L2	5.875 U1,R3, W8	6.825 A5,W8, W10,L2,B5		4.225 U1,W8, I3,A1,R3	5.275 U1	5.80 U1	6.45 U1	5.75 A5, R3,N4,W7
	Cleveland, Ohio	4.30 R3	4.30 R3	5.40 A5,C13		6.825 A5 6.865 C13	6.45 R3	4.225 J3,R3	5.275 J3		6.45 J3,R3	5.75 A5, C13
	Detroit, Mich.	4.40 G3 4.45 R5		5.40 R5 5.60 B5,P8 5.85 P3	5.875 R5 5.175 G3	6.825 R5 6.825 B5,P3, P8	6.55 G3	4.325 G3			6.85 G3	
	Duluth, Minn.											5.75 A3
	Gary, Ind. Harbor, Crawfordsville	4.30 I3, U1, Y1	4.30 I3, U1, Y1	5.40 M5,R3	5.875 I3, U1, Y1	6.825 M5 6.825 R3	6.45 U1,I3, Y1	4.225 J3, U1,Y1	5.275 I3	5.80 U1,Y1	6.45 U1,I3, Y1	5.85 M4
	Granic City, Ill.							4.425 G2				
	Kokomo, Ind.											5.85 C9
	Sterling, Ill.	4.40 N4	4.40 N4									5.85 N4
	Niles, Ohio Sharpen, Pa.	4.30 R3					6.45 R3	4.225 S1,R3		5.80 S1	6.45 S1	
	Pittsburgh, Pa. Midland, Pa.	4.30 J3, U1, C11	4.30 J3, U1	5.40 A5,C8, C11,J3, W10,B4,R3	5.875 U1,C11	6.825 A5,C11, W10,C8,R3	6.45 J3, U1	4.225 J3, U1	5.275 U1	5.80 U1	6.45 J3, U1	5.75 A5,J3, P6
WEST	Portsmouth, Ohio											5.75 P7
	Weirton, Wheeling, Follansbee, W. Va.	4.30 W3						4.225 W3, W5				
	Youngstown, Ohio	4.30 U1,Y1, C10,R3	4.30 U1,Y1, R3	5.40 F2,Y1, C10	5.875 U1,Y1, C10	6.825 Y1,C10 6.865 F2	6.45 U1,Y1	4.225 U1,Y1, R3		5.80 Y1	6.45 Y1	5.75 Y1
	Emeryville, Cal.	5.85 J5	5.85 J5									
	Fontana, Cal.	5.80 K1	5.80 K1		6.125 K1			7.70 K1	4.875 K1		6.45 K1	7.15 K1
	Geneva, Utah								4.225 C7			6.45 C7
	Kansas City, Mo.	4.55 S2	4.55 S2		5.325 S2		6.70 S2					6.80 S2
	Los Angeles, Torrance, Cal.	5.80 B2,C7	5.80 B2,C7	6.85 R3	6.125 B2		7.15 B2					6.70 B2
	Minnequa, Colo.	4.75 C6	4.75 C6						5.875 C6			6.80 C6
	Portland, Ore.	5.85 O2	5.85 O2									
SOUTH	San Francisco, Niles, Pittsburgh, Cal.	5.80 C7,P9 5.85 B2	5.80 C7,P9 5.85 B2				7.20 B2					6.70 C7
	Seattle, Wash.	5.85 B2,P12, N6	5.85 B2,P12				7.20 B2	5.125 B2		6.70 B2	7.35 B2	
	Atlanta, Ga.	4.50 A8	4.50 A8									5.85 A8
	Fairfield, Ala. City, Birmingham, Ala.	4.30 T2,C16, R3	4.30 T2,C16, R3				6.45 T2	4.225 T2,R3		6.45 T2	5.75 R3, T2	
	Houston, Ft. Worth, Lone Star, Tex.	4.55 S2	4.55 S2		5.325 S2		6.70 S2	4.55 L3 4.275 S2		5.85 S2	6.50 S2	6.80 S2

Steel Prices

(Effective Jan. 25, 1955)

Key to Steel Producers

With Principal Offices

A1	Acme Steel Co., Chicago
A2	Alcoa Steel Co., Pittsburgh
A3	Allied Steel Corp., Pittsburgh
A4	American Cast Metals Co., Carnegie, Pa.
A5	American Steel & Wire Div., Cleveland
A6	Angell Nail & Cheplin Co., Cleveland
A7	Arco Steel Corp., Middletown, O.
A8	Atlantic Steel Co., Atlanta, Ga.
B1	Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2	Bethlehem Pacific Coast Steel Corp., San Francisco
B3	Bethlehem Steel Co., Bethlehem, Pa.
B4	Blair Strip Steel Co., New Castle, Pa.
B5	Blim & Laughlin, Inc., Harvey, Ill.
C1	Calstrip Steel Corp., Los Angeles
C2	Carpenter Steel Co., Reading, Pa.
C3	Central Iron & Steel Co., Harrisburg, Pa.
C4	Claymont Products Dept., Claymont, Del.
C5	Cold Metal Products Co., Youngstown, O.
C6	Colorado Fuel & Iron Corp., Denver
C7	Columbia Geneva Steel Div., San Francisco
C8	Columbia Steel & Shaping Co., Pittsburgh
C9	Continental Steel Corp., Kokomo, Ind.
C10	Copperweld Steel Co., Pittsburgh, Pa.
C11	Crucible Steel Co. of America, New York
C12	Cumberland Steel Co., Cumberland, Md.
C13	Cuyahoga Steel & Wire Co., Cleveland
C14	Compressed Steel Shaping Co., Readville, Mass.
C15	G. O. Carlson, Inc., Thorndale, Pa.
C16	Convers Steel Div., Birmingham
D1	Detroit Steel Corp., Detroit
D2	Detroit Tube & Steel Div., Detroit
D3	Driver Harris Co., Harrison, N. J.
D4	Dickens Weatherproof Nail Co., Evanston, Ill.
E1	Eastern Stainless Steel Corp., Baltimore
E2	Empire Steel Co., Mansfield, O.
F1	Firth Sterling, Inc., McKeesport, Pa.
F2	Fitzsimmons Steel Corp., Youngstown
F3	Follansbee Steel Corp., Follansbee, W. Va.
G1	Globe Iron Co., Jackson, O.

G2	Granite City Steel Co., Granite City, Ill.
G3	Great Lakes Steel Corp., Detroit
G4	Greer Steel Co., Dover, O.
H1	Hann Furnace Corp., Detroit
H2	Ingersoll Steel Div., Chicago
H3	Inland Steel Co., Chicago
H4	Interlake Iron Corp., Cleveland
J1	Jackson Iron & Steel Co., Jackson, O.
J2	Jesse Steel Corp., Washington, Pa.
J3	Jones & Laughlin Steel Corp., Pittsburgh
J4	Joslyn Mfg. & Supply Co., Chicago
J5	Judson Steel Corp., Emeryville, Calif.
K1	Kaiser Steel Corp., Fontana, Cal.
K2	Keystone Steel & Wire Co., Peoria
K3	Keppen Co., Granite City, Ill.
L1	Laclede Steel Co., St. Louis
L2	La Salle Steel Co., Chicago
L3	Lone Star Steel Co., Dallas
L4	Lukens Steel Co., Coatesville, Pa.
M1	Mahoning Valley Steel Co., Niles, O.
M2	McLouth Steel Corp., Detroit
M3	Mercer Tube & Mig. Co., Sharon, Pa.
M4	Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5	Monarch Steel Co., Inc., Hammond, Ind.
M6	Mystic Iron Works, Everett, Mass.
N1	National Supply Co., Pittsburgh
N2	National Tube Div., Pittsburgh
N3	Niles Rolling Mill Div., Niles, O.
N4	Northwestern Steel & Wire Co., Sterling, Ill.
N5	Newport Steel Corp., Newport, Ky.
N6	Northwest Steel Rolling Mills, Seattle
N7	Newman Crosby Steel Co., Pawtucket, R. I.
O1	Oliver Iron & Steel Co., Pittsburgh
O2	Oregon Steel Mills, Portland
P1	Page Steel & Wire Div., Monessen, Pa.
P2	Phoenix Iron & Steel Co., Phoenixville, Pa.
P3	Pilgrim Drawn Steel Div., Plymouth, Mich.
P4	Pittsburgh Coke & Chemical Co., Pittsburgh
P5	Pittsburgh Screw & Bolt Co., Pittsburgh
P6	Pittsburgh Steel Co., Pittsburgh
P7	Portsmouth Div., Detroit Steel Corp., Detroit
P8	Plymouth Steel Co., Detroit
P9	Pacific States Steel Co., Niles, Cal.
P10	Precision Drawn Steel Co., Camden, N. J.
P11	Production Steel Strip Corp., Detroit
P12	Pacific Steel Rolling Mills, Seattle
R1	Reeves Steel & Mig. Co., Dover, O.
R2	Reliance Div., Eaton Mig. Co., Massillon, O.
R3	Republic Steel Corp., Cleveland
R4	Roebling Sons Co., John A., Trenton, N. J.
R5	Rotary Electric Steel Co., Detroit
R6	Rodney Metals, Inc., New Bedford, Mass.
R7	Ross Strip Steel Co., Rose, N. Y.
S1	Sharon Steel Corp., Sharon, Pa.
S2	Sheffield Steel Corp., Kansas City
S3	Simmsong Furnace Co., Pittsburgh
S4	Simonds Saw & Steel Co., Fitchburg, Mass.
S5	Sweet's Steel Co., Williamsport, Pa.
S6	Standard Forging Corp., Chicago
S7	Stanley Works, New Britain, Conn.
S8	Superior Drawn Steel Co., Monroe, Pa.
S9	Superior Steel Corp., Carnegie, Pa.
T1	Towanda Iron Div., N. Tonawanda, N. Y.
T2	Tennessee Coal & Iron Div., Fairfield
T3	Tennessee Products & Chem. Corp., Nashville
T4	Thomas Strip Div., Warren, O.
T5	Timken Steel & Tube Div., Canton, O.
T6	Tremont Nail Co., Wareham, Mass.
T7	Texas Steel Co., Fort Worth
U1	United States Steel Corp., Pittsburgh
U2	Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3	Ulrich-Stainless Steel, Wallingford, Conn.
U4	U. S. Pipe & Foundry Co., Birmingham
W1	Wallingford Steel Co., Wallingford, Conn.
W2	Washington Steel Corp., Washington, Pa.
W3	Weirton Steel Co., Weirton, W. Va.
W4	Wheeland Tube Co., Wheeland, Pa.
W5	Wheeling Steel Corp., Wheeling, W. Va.
W6	Wickwire Spencer Steel Div., Buffalo
W7	Wilson Steel & Wire Co., Chicago
W8	Wisconsin Steel Co., S. Chicago, Ill.
W9	Woodward Iron Co., Woodward, Ala.
W10	Wyckoff Steel Co., Pittsburgh
W11	Worcester Pressed Steel Co., Worcester, Mass.
Y1	Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per) l.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD										SEAMLESS											
	1/2 in.		5/8 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.			
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.		
Sparrows Pt. B3	21.75	6.5	24.75	16.5	27.25	14.0	29.75	14.75	30.25	15.75	36.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....
Youngstown R3	23.75	8.5	36.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....
Fontana K1	16.75	W4.5	13.75	W6.5	16.25	16.0	18.75	2.35	19.25	4.75	19.75	5.25	21.25	5.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Pittsburgh J3	23.75	8.5	36.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Alton, Ill. L1	21.75	8.5	24.75	16.5	27.25	14.0	29.75	14.75	30.25	15.75	36.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon N2	21.75	8.5	24.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless N2	21.75	8.5	24.75	16.5	27.25	14.0	29.75	14.75	30.25	15.75	36.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh N1	23.75	8.5	26.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling W5	23.75	8.5	26.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheeland W4	23.75	8.5	26.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown Y1	23.75	8.5	26.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor Y1	22.75	7.5	25.75	11.5	28.25	15.0	30.75	16.75	31.25	16.75	31.75	17.25	33.25	17.0	21.75	17.0	22.25	17.0	23.25	17.0	24.25	17.0
Lorain N2	23.75	8.5	26.75	12.5	28.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	W1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG PLAIN ENDS	25.25	11.5	29.25	18.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Sparrows Pt. B3	25.25	11.5	29.25	18.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown R3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless N2	25.25	11.5	29.25	18.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana K1	14.25	8.5	18.25	11.5	20.25	16.0	21.75	21.25	22.25	21.75	22.75	21.25	23.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh J3	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Alton, Ill. L1	25.25	11.5	29.25	15.5	31.25	16.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Sharon N2	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Pittsburgh N1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Wheeland W4	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Youngstown Y1	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Indiana Harbor Y1	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	
Lorain N2	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	19.0	3.25	21.5	5.75	26.5	10.75	

Threads only, butt welded and seamless 2 1/4 pt. higher discount. Plain ends, butt welded and seamless, 2-in. and under, 4 1/2 pt. higher discount. Butt welded jobbers discount, 5 pt. Galvanized discounts based on nine price range of over 96 to 116 incl. per lb. East St. Louis. For each 2¢ change in size, discounts vary as follows: 1/2, 5/8, 1 in.-, 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt. o.g.; nine price range of over 76 to 96 would lower discounts; nine price in range of over 76 to 96 would increase discounts. East St. Louis size price now 11.50¢ per lb.

Steel Prices

(Effective Jan. 26, 1955)

To identify producers, see Key on preceding page.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer U.I.	4.45	5.35	5.425				
So. Chicago R.J.				7.30			
Ensey T.J.	4.45	5.35					
Fairfield T.J.		5.35		7.30		5.275	
Gary U.I.	4.45	5.35				5.275	
Ind. Harbor I.J.	4.45		5.425	7.30		5.275	
Johnstown B.S.		6.35					
Joliet U.I.		5.35	5.425				
Kansas City S.J.				7.30		11.50	
Lackawanna B.S.	4.45	5.35	5.425			5.275	
Minnesota C.S.	4.45	5.85	5.425	7.30		5.275	11.50
Pittsburgh O.I.					11.00		11.50
Pittsburgh P.S.					11.00		11.50
Pittsburgh J.S.				7.30			
Seattle B.J.				7.30		5.425	12.00
Staunton B.J.	4.45		5.425				
Struthers Y.I.				7.30		5.275	
Torrance C.J.						5.425	
Williamsport S.S.	5.35					5.425	
Youngstown R.J.				7.30			

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb	22-Gage	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi- Processed	Fully Processed
Fluid			8.025	8.225
Armature			8.50	8.75
Elect.			9.10	9.35
Motor			10.10	10.35
Dynamo			11.60	11.25
Trans. 72			11.95	11.75
Trans. 65			12.20	12.70
Trans. 55		12.50		
Trans. 52		13.00	Trans. 60	16.60
			Trans. 73	17.10

Producing points: Beech Bottom (W.F.); Brackenridge (A.S.); Granite City (G.C.); Indiana Harbor (I.H.); Mansfield (E.Z.); Newport, Ky. (N.S.); Niles, O. (N.S.); Vandergrift (U.I.); Warren, O. (R.J.); Zanesville (A.T.).

*Cells 75% higher.

CLAD STEEL

F.o.b. Mill	Col	Col	Col	Col	Sheet
Alabama City R.J.	137	146	155	159	6.90
Albuquerque, Pa. J.S.	137	149	156	160	6.90
Atlanta A.B.	139	151	157	164	7.00
Bartowville K.Z.	139	151	157	164	7.00
Buffalo W.S.					6.90
Chicago, Ill. N.W.	137	149	155	162	6.90
Cleveland A.G.	142				6.90
Cleveland A.S.					6.90
Crawfordsville M.M.	139	151	157	159	7.00
Donora, Pa. A.S.	137	146	155	159	6.90
Duluth A.S.	137	146	155	159	6.90
Fairfield, Ala. T.J.	137	146	155	159	6.90
Galveston D.A.	139				6.90
Houston S.J.	142	154			6.90
Johnstown, Pa. B.J.	137	149			6.90
Joliet, Ill. A.S.	137	146	155	159	6.90
Kokomo, Ind. C.Y.	139	149	157	161	7.00
Los Angeles B.Z.					6.90
Kansas City S.J.	142	150	167	164	7.00
Minnegos C.S.	142	154	160	168	7.15
Monesson P.G.	137	151			6.90
Moline, Ill. R.J.					6.90
Pittsburgh, Cal. C.T.	156	169	175	179	7.65
Portsmouth P.T.					6.90
Rankin, Pa. A.S.	137	146	155	159	6.90
So. Chicago R.J.	137	146	145	155	6.90
S. San Francisco C.S.					7.00
Sparrows Pt. B.S.	139		157	164	7.00
Struthers, O. V.I.					6.90
Worcester A.S.	143				7.20
Williamsport, Pa. S.S.		150			

* Includes annealing and pickling, sandblasting.

WARE-HOUSES

City	Delivery Charge	Sheets		Strip	Plates	Shapes	Bars	Alloy Bars				
		Hot-Rolled	Cold-Rolled (15 gauge)					Hot-Rolled	Cold-Finished	Hot-Rolled A 413	Hot-Rolled A 416	Hot-Rolled Annealed
Baltimore	\$20	6.22	7.51	7.78	6.89		6.57	6.92	6.68	8.52		
Birmingham	15	6.35	7.25	8.25	6.60	9.00	6.65	6.50	9.00			
Boston	10	7.23	8.23	9.43	7.47	9.65	7.24	7.49	7.20	8.00	12.60	12.45
Buffalo	20	6.35	7.49	8.50	6.70		6.45	6.70	6.56	7.85	12.50	12.15
Chicago	20	6.38	7.38	8.50	6.62		6.70	6.77	6.58	7.90	12.00	12.46
Cincinnati	15	6.49	7.37	8.25	6.84		6.21	6.91	6.75	7.80	12.55	12.15
Cleveland	20	6.38	7.28	8.45	6.72		6.46	6.80	6.65	7.65	12.25	12.28
Denver	6.15	9.15	10.37	8.40			6.10	8.15	8.30	9.27		
Detroit	20	6.57	7.57	8.50	6.90		6.39	7.16	6.79	7.77	12.45	12.10
Houston	20	7.35	7.80	9.93	7.70		7.35	7.60	7.70	9.50		
Kansas City	20	7.05	8.65	9.95	7.29		7.19	7.36	7.10	8.07		
Los Angeles	20	7.50	9.35	9.95	7.85		7.45	7.65	7.45	8.15		
Memphis	10	6.79	7.69		6.90		7.01	7.89	6.88	8.24		
Milwaukee	20	6.47	7.47	8.21	6.71		6.61	6.86	6.60	7.00	12.34	11.99
New Orleans	15	6.70	7.65	9.23	6.80		6.60	7.05	6.84	7.70		
New York	10	6.97	7.78	8.79 ¹	7.36		6.95	7.18	6.63	12.63	12.28	
Norfolk	20	7.00					7.27	7.38	7.37	8.73		
Philadelphia	10	6.19	7.29	8.09 ¹	6.96		6.49	6.54	6.74	8.19 ²		
Pittsburgh	20	6.38	7.38	8.36	6.72		6.52	6.68	6.51	7.65	12.25	
Portland	20	7.60	8.75	9.05	7.85		7.45	7.50	7.55	10.95		
Salt Lake City	20	7.65	10.20	10.70	9.05		7.70	7.79	8.00	10.95		
San Francisco	20	7.35	8.95	9.35	7.80		7.40	7.50	7.35	10.65		
Seattle	20	6.10	9.80	10.15	8.20		7.30	7.75	7.80	10.95		
St. Louis	20	6.62	7.67	8.54	6.91		6.81	7.00	6.88	12.54	12.19	14.84
St. Paul	15	7.03	8.03	8.96	7.23		7.19	7.35	7.16	8.26		15.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) \$35 delivery. (4) 1000 to 1999 lb. \$25 delivery.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails			
	Woven Wire Fence 8-15½ in.	Wire Fence Posts	Single Loop Bale Tie	Cat., Barbed and Twisted Barbwire Wires
Alabama City R.J.	137	146	155	159
Albuquerque, Pa. J.S.	137	149	156	160
Atlanta A.B.	139	151	157	164
Bartowville K.Z.	139	151	157	164
Buffalo W.S.				
Chicago, Ill. N.W.	137	149	156	160
Cleveland A.G.	142			
Cleveland A.S.				
Crawfordsville M.M.	139	151	157	164
Donora, Pa. A.S.	137	146	155	159
Duluth A.S.	137	146	155	159
Fairfield, Ala. T.J.	137	146	155	159
Galveston D.D.				
Houston S.J.	142	154	164	170
Johnstown, Pa. B.J.	137	149	156	160
Joliet, Ill. A.S.	137	146	155	159
Kokomo, Ind. C.Y.	139	149	157	161
Kansas City S.J.	142	150	167	164
Minnegos C.S.	142	154	160	168
Monesson P.G.	137	151		
Moline, Ill. R.J.				
Pittsburgh, Cal. C.T.	156	169	179	179
Portsmouth P.T.				
Rankin, Pa. A.S.	137	146	155	159
So. Chicago R.J.	137	146	145	150
S. San Francisco C.S.				
Sparrows Pt. B.S.	139		157	164
Struthers, O. V.I.				
Worcester A.S.	143			
Williamsport, Pa. S.S.		150		

Cat Nails, carloads, base \$8.30 per kg at Cambria, Pa. (42).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

C-R SPRING STEEL

F.o.b. Mill	CARBON CONTENT				
	0.26	0.41	0.61	0.81	1.06
Bridgeport, New Britain, Conn. S.P.	5.75	6.00	6.90	11.15	13.66
Rufus, N.Y. R.J.	5.75	6.05	6.90	10.95	13.29
Carnegie, Pa. S.P.	5.75	6.05	6.90	11.15	13.48
Cleveland A.S.	5.75	6.05	6.90	11.15	13.88
Detroit D.I.	5.75	6.25	6.90	11.25	
Detroit D.Z.	5.75	6.25	6.90	11.25	
Harrison, N.J. C.I.	6.00	6.20	6.90	11.15	14.19
Indianapolis C.S.	5.75	6.05	6.90	11.15	13.88
New Castle, Pa. B.P.	5.75	6.05	6.90	11.25	
New Haven, Conn. D.I.	6.20	6.25	6.90	11.25	
Pawtucket, R.I. N.Y.	5.75	6.25	6.90	11.25	
Riverdale, N.J. A.S.	5.75	6.05	6.90	11.15	13.85
Sharon, Pa. S.P.	5.75	6.05	6.90	11.15	13.48
Trenton R.V.	6.25	6.25	6.90	11.45	14.19
Wallingford W.P.	6.25	6.25	6.90	11.45	14.45
Warren, Ohio T.V.	6.25	6.25	6.90	11.45	14.45
Watertown, W. Va. W.P.	6.25	6.25	6.90	11.45	13.25
Worcester, Mass. A.S.	6.00	6.25	6.90	11.45	14.15
Youngstown C.S.	5.75	6.05	6.90	11.15	13.85

* Sold on Pittsburgh base.

BOILER TUBES

Size

Miscellaneous Prices

(Effective Jan. 26, 1955)

TOOL STEEL

F.o.b. mill					
W	Cr	V	Mo	Co	per lb
18	4	1	—	—	\$1.54
18	4	—	—	5	2.245
18	4	2	—	—	1.705
1.5	9	1.5	—	—	.90
6	4	2	6	—	1.29
High-carbon chromium					.73
Oil hardened manganese					.405
Special carbon					.37
Extra carbon					.31
Regular carbon					.26
Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.					

CAST IRON WATER PIPE

		Per Net Ton
6 to 24-in., del'd Chicago	\$111.80	to \$115.20
6 to 24-in., del'd N. Y.	115.00	to 116.00
6 to 24-in., Birmingham	98.00	to 102.50
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less	\$129.50	to \$131.50
Class "A" and gas pipe, \$8 extra; 4-in. pipe is \$5 a ton above 6-in.		

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1955, to end of 1956 season.

		Gross Ton
Openhearth lump		\$11.15
Old range, bessemer		18.30
Old range, nonbessemer		10.15
Mesabi, bessemer		10.05
Mesabi, nonbessemer		9.90
High phosphorus		8.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1955. Increases or decreases after such date are for buyer's account.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	\$14.25 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.50 to \$17.00
Foundry, oven coke	
Buffalo, del'd	\$28.05
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.00
Swedenland, Pa., f.o.b.	22.00
Painesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.42
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	94	20.00	48	100, 110	8.00
20	72	20.00	38	110	8.00
12 to 1P	72	20.00	30	110	8.00
7 to 10	60	21.00	24	72 to 84	8.10
8	60	23.25	20	90	8.00
4	40	26.00	17	72	8.10
3	40	27.25	14	72	8.00
2½	36	28.00	10, 12	80	10.30
2	34	43.00	8	80	10.50

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount	
	Less Case	C.
1/2 in. & smaller x 4 in. & shorter	2	22
1/2 in. & smaller x 6 in. & shorter	+3	18
9/16 in. & 5/8 in. x 6 in. & shorter	+4	17
5/8 in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in. & shorter	+15	8
1/2 in. & smaller x 6 in. & shorter	+3	18
Lag. all diam. x 6 in. & shorter	6	25
Lag. all diam. longer than 6 in.	+2	19
Plow bolts	22	22

Nuts, H.P., C.P., reg. & hvy.

	Discount	Base Case or Keg
	Less Case	C.
5/8" or smaller	55	64
5/8" to 1 1/4" inclusive	58	66
1 1/4" to 1 1/2" inclusive	60	67 1/2

C.P. Hex regular & hvy.

All sizes	55	64

Hot Galv. Nuts (all types)

	38	50
	41	52 1/2

Finished, Semi-Finished, Slotted or Cylindrical Nuts

All sizes	55	66

Rivets

	Base per 100 lb	
	Pot Off List	
1/2 in. & larger	39.25	
7/16 in. and smaller	37	

Cap Screws

	Discount	H.C. Heat
	Bright	Treated
New std. hex head, packed		
5/8" x 6" and smaller and shorter	38	28
5/8", 1", 1 1/2" x 6" and shorter	15	1
New std. hex head, bulk		
5/8" x 6" and smaller and shorter	50	42
5/8", 1", 1 1/2" x 6" and shorter	32	21
• Minimum quantity per item:		
15,000 pieces 5/8", 5/16", 3/8" diam.		
5,000 pieces 7/16", 1/2", 9/16", 5/8" diam.		
2,000 pieces 5/8", 1/2", 1" diam.		

Machine Screws & Stove Bolts

	Discount	Mach. Stove
	Screws	Bolts
Packaged, package list	33	43
Bulk, bulk list		

Quantity	59	17
15,000- 99,999	59	17
100,000-199,999	63	25
200,000 & over	67	33
5/16-in. diam. &	15,000- 49,999	59
50,000- 99,999	63	25
larger diam.	100,000 & over	67
over 3 in.	50,000- 49,999	59
long	100,000 & over	67

Machine Screw & Stove Bolt Nuts

	Discount	Hex Square
	50	33
Packaged, package list		
Bulk, bulk list		

Quantity	15	17
15,000- 99,999	15	17
100,000-199,999	23	25
200,000 & over	31	33

REFRACTORIES

Fire Clay Brick

Carloads per 1000	
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	
114.00	
No. 1 Ohio	107.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	107.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	17.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$120.00
Childe, Hays, Pa.	125.00
Chicago District	130.00
Western Utah	110.00
California Super Duty	
Hays, Pa., Athens, Tex., Windham, Curtner, Calif.	137.00
155.00	
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	20.00
Silica cement, net ton, bulk, Hays, Pa.	22.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	21.00
Silica cement, net ton, bulk, Utah and Calif.	and Calif.

Chrome Brick

Per net ton
Standard chemically bonded, Balt.
\$86.00
Standards chemically bonded, Curtner, Calif.
96.25
Burned, Balt.
50.00

Magnesite Brick

Standard Baltimore	\$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite

St. % -in. grains
Domestic, f.o.b. Baltimore
in bulk fines removed
Domestic, f.o.b. Chehalis, Wash., Luning, Nev.
in bulk
in sacks

Dead Burned Dolomite

Per net ton
F.o.b. bulk, producing points in:
Pa., W. Va., Ohio
14.50
Midwest
15.10
Missouri Valley
13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclare, Ill. Price, net ton; effective CaF₂ content

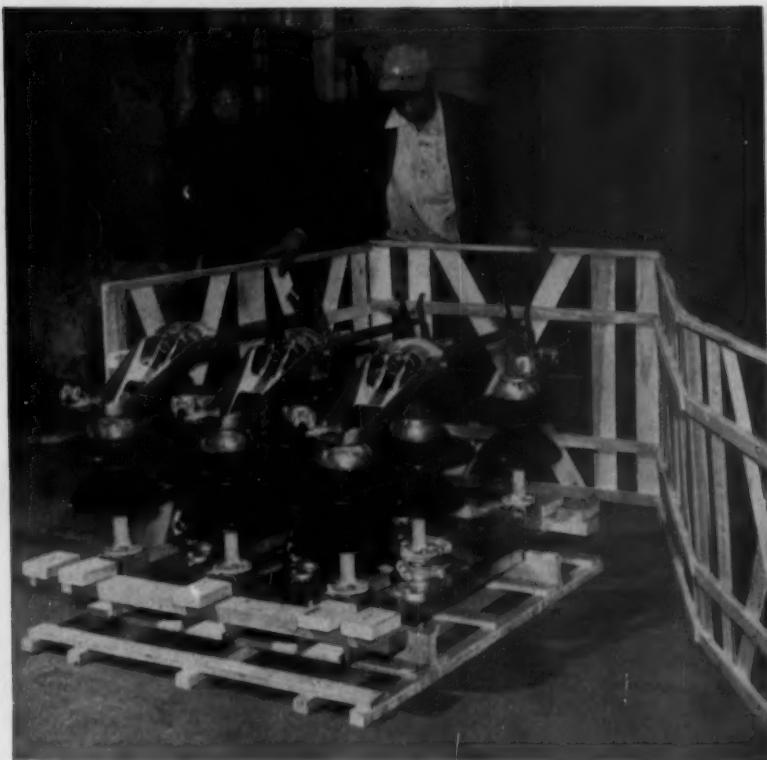
72 1/2%	\$44.00
70% or more	42.50
60% or less	38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.

<tbl_r cells="1" ix="1" maxcspan



Switch is set in place by lift truck on pallet base specially designed to permit use of same crate for switches of two sizes. Wirebound mats wrap around easily, are secured in minutes.

Although 106 pounds lighter than previous container, which was custom built for each switch, rugged engineered wirebound permits fork lift handling and stacking of 759-lb. gross weight units.



Hold-down assembly, already in place here, goes on next. Then top is placed in position and nailed. All parts fit nicely, reinforcing each other for strength and easy assembly.



Prize-winning General-Engineered Wirebound Cuts Packing Time 85% for Delta Star



This wirebound crate won first award for excellence of design for Delta Star in the 1954 competition sponsored by the Society of Industrial Packaging and Material Handling Engineers, the 6th consecutive first for containers by General Box.

The change from a custom-built crate to a General wirebound design cut packaging time for high-voltage disconnect switches from $3\frac{1}{2}$ hours to $\frac{1}{2}$ hour and reduced gross shipping weight 106 pounds per unit—from 865 to 759 pounds. These important savings were accomplished by Delta Star Electric Division, H. K. Porter Company, Inc., of Pittsburgh.

Skilled labor was required to build the crates formerly used, while the precision-made parts of the new wirebound are put together by unskilled labor. A bit of ingenious design that makes the crate quickly adaptable to another size switch permits standardization. There is a further saving in the

lower cost of the materials in the General wirebound, an improvement in the degree of protection afforded—thanks to engineered and tested design—and an improvement in the appearance of the container.

Specialized experience and design and testing facilities unmatched in the industry are applied to the creation of custom-designed, volume-produced containers by General Box. To find out how much better your packaging can be, have a General man call. No obligation. Consult your local directory, or write direct. Ask for your free copy of illustrated booklet "The General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Prescott, Ark.; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

- Wirebound Crates and Boxes • Generalift Pallet Boxes •
- Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

General Box

1829 Miner Street, Des Plaines, Illinois



Ferroalloy Prices

(Effective Jan. 25, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 5% max Si.	
0.025% C	34.00
0.025% C, Simplex	34.50
0.05% C	34.50
0.10% C	34.00
65-69% Cr, 4-9% C	24.75
62-66 Cr, 4-6% C, 6.5% Si	26.00

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.	
High carbon type: 65.55% Cr, 4-6% Si, 2.5% max Fe.	
Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add \$4 per lb to regular low carbon ferrochrome price schedule. Add \$4 for each additional 0.25% of N.	
--	--

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10 max. C	31.18
0.50% max. C	1.16
9 to 11% C	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.0¢ per lb contained Si. Bulk 2-in. x down, 26.0¢ per lb contained Cr plus 10.8¢ per lb contained Si. Bulk 1-in. x down, 25.5¢ per lb contained Cr plus 11.0¢ per lb contained Si.	
Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 12.0¢ per lb contained Si. Bulk 2-in. x down, 26.0¢ per lb contained Cr plus 10.8¢ per lb contained Si. Bulk 1-in. x down, 25.5¢ per lb contained Cr plus 11.0¢ per lb contained Si.	
Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	26.06
Ton lots	22.30
Less ton lots	23.20

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe $\frac{1}{2}$ in. x 12 mesh.	
Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots	16.80
Ton lots	18.10
Less ton lots	19.35

Graphides No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5 to 52%; Ti 9 to 11%; Ca 5 to 7%.	
Carload packed	17.50
Ton lots to carload packed	18.50
Less ton lots	20.00

Ferromanganese

Maximum contract base price, f.o.b. lump size, base content 74 to 76 per cent Mn:

Producing Point	per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, \$6 per lb Mn:	
Carloads, bulk	11.85
Ton lots packed	13.65

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmyra, Pa.	
Manganese Silicon	
16 to 19% 3% max.	\$24.00
19 to 21% 3% max.	26.00
21 to 23% 3% max.	28.50
23 to 25% 3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.60
Ton lots	43.60

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn	21.85¢
--	--------

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.	
Carloads Ton Less	
0.07% max. C, 0.08% P, 90% Mn	32.00 33.85 35.05
0.07% max. C	29.95 31.80 33.80
0.15% max. C	28.45 30.30 31.50
0.30% max. C	26.95 28.80 30.00
0.50% max. C	26.45 28.30 29.50
0.75% max. C, 80-85% Mn, 5-7% Zr, 2.5% max. Fe	23.45 25.30 26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.	
Carload bulk	11.00
Ton lots	12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet	12.45
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$88.00. Add \$1.00 per ton for each additional 0.50% Si up to and including 17%. Add \$1.45 for each 0.50% Mn over 1%.	
---	--

Silicon Metal

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.	
Ton lots Carloads	
96% Si, 2% Fe	20.10 18.00
97% Si, 1% Fe	20.60 18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.	
Carloads, bulk	6.55
Ton lots	6.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.	
25% Si	20.00 75% Si
50% Si	12.00 85% Si
65% Si	18.50 90% Si

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	3.40 2.80 4.55

Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.	
Openhearth	\$2.00-\$3.10
Crucible	2.10-3.20
High speed steel (Primos)	3.20-3.35

Alsifer, 20% Al, 40% Si, 40% Fe, Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	9.25¢
Ton lots	10.15
Calcium molybdate, 46.3-46.6% contained Mo	\$1.28
Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Crb.	
Ton lots	\$12.00
Less ton lots	12.05

Ferro-tantul-columbium, 20% Ta, 40% Crb, 30% C, contract basis, f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, carload per net ton

Ton lots	\$1.35
--------------------	--------

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langelo, Pa., per pound contained Mo

Ton lots	\$1.46
--------------------	--------

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton

Ton lots to less carload	\$9.00
------------------------------------	--------

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, carload per net ton

Ton lots	\$17.00
--------------------	---------

Ferrotungsten, 14 x down packed, per pound contained W. ton lots, f.o.b.

W. ton lots	\$3.88
-----------------------	--------

Molybde oxide, briquets, per lb contained Mo, f.o.b. Langelo, Pa., bags, f.o.b. Washington, Pa.,

bags	\$1.27
----------------	--------

Simanni, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.



PROFIT Pictures

Thin, high-strength shell walls bonded with Resinox save man-hours, shop space and money.

Picture of a man cutting costs 30%

In most casting jobs, the two critical factors are quality and cost. "But when you're casting aircraft parts, which is our specialty," says Earl Donelan, Superintendent of Thompson Product's Kolcast Division in Cleveland, "you don't tamper with quality. It's cost that gets the double squeeze."

"Shell molding, using Monsanto's Resinox® resins, has enabled us to reduce weight of castings, increase sectional changes in the part, cut finishing costs, maintain closer tolerances, cast thinner walls, reduce mismatching and core-shift by 50%, and lower our final customer cost by more than 30%."

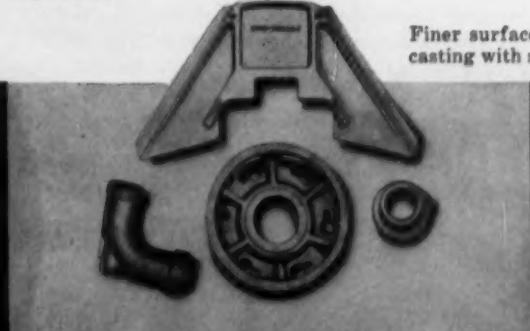
Mr. Donelan is also sold on Monsanto's technical service. He explains it this way:

"When we first thought of shell molding back in 1951, we turned to Monsanto. They literally moved in and lived with our problems. They rolled up their sleeves and worked out kinks in sand and core mixtures until we had what we wanted. Monsanto's customer service, like Monsanto resins, is second to none."

For research-developed and shop-tested resins to meet your foundry needs, for shell molding, core binding or sand conditioning, write first to Monsanto Chemical Company, Plastics Division, Springfield 2, Mass.

*Reg. U.S. Pat. Off.

Finer surface finish, fewer rejects, closer tolerances are results of casting with shell molds bonded with Monsanto quality Resinox resin.



RESINOX®

MORE HP PER POUND • MORE HP PER CU. IN. • MORE HP PER DOLLAR



CONE-DRIVE GEARS

DOUBLE ENVELOPING GEAR SETS & SPEED REDUCERS

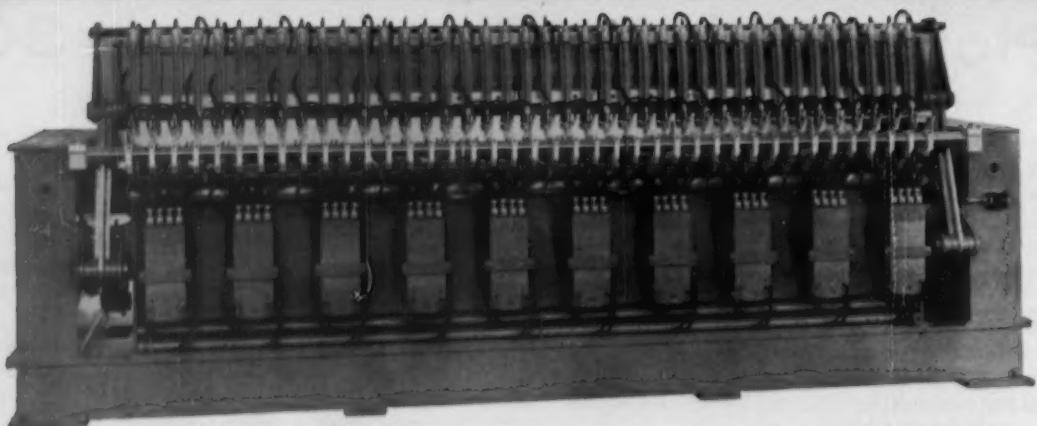
Division, Michigan Tool Company

7171 E. McNichols Road • Detroit 12, Michigan

Ask for Bulletin 8901-50

Size for size, Cone-Drive speed reducers will outperform any other worm-gearred speed reducer on the market!

Standard 13 ft. Wire Mesh Welding Machine



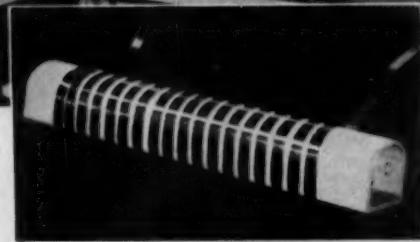
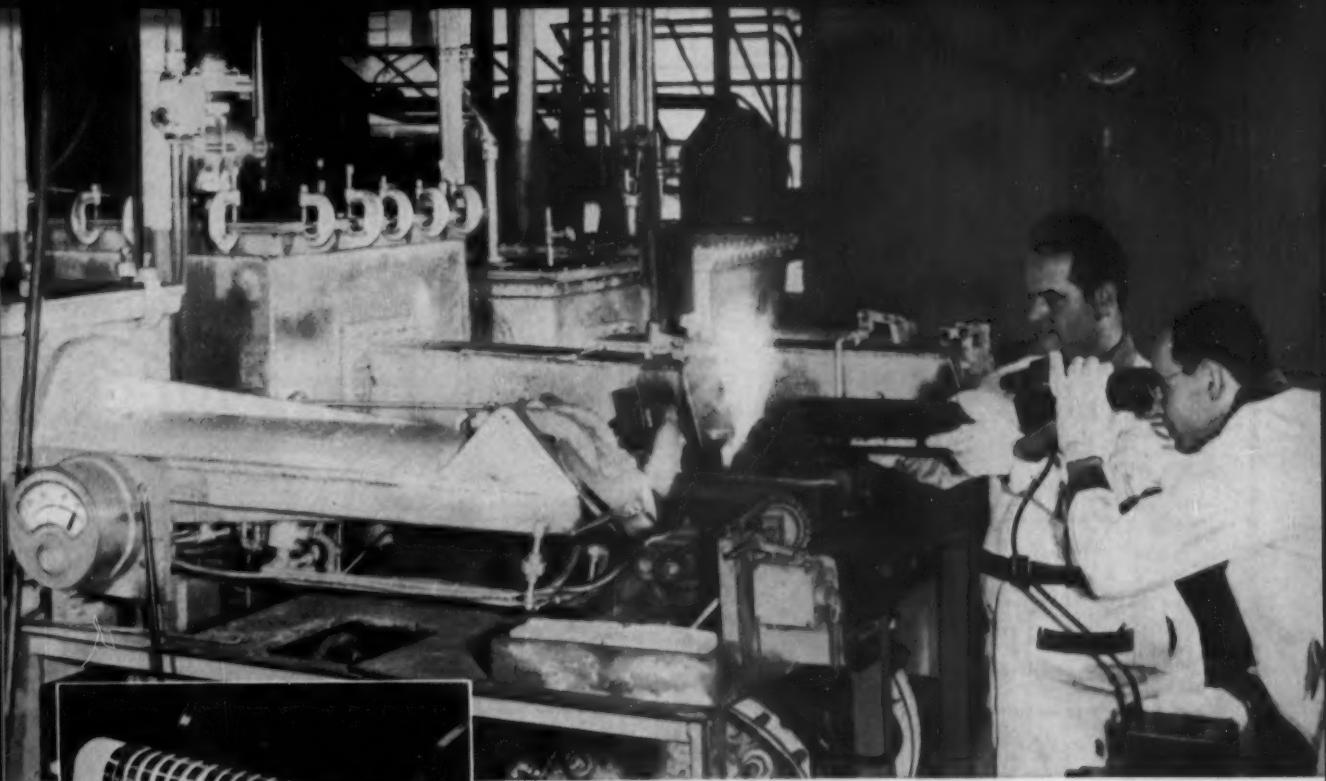
Sixty Cross Wires per minute . . . 2" Min. to 12" Max. Spacings . . . Easily Adjusted Cross Wire and Longitudinal Wire Spacing . . . Hand-Started Pattern not required to start New Mesh Pattern . . . Cross Wire may be Pre-Straightened and Hand-Loaded or Auto-

matically loaded with Cross Wire Feed Accessory . . . Accessories Available: Cross Wire Feed, Take-up Mandrel, Longitudinal Wire Straightener . . . (Three Handwheels Adjust All Longitudinal Wire Straightener Rolls in Unison.)

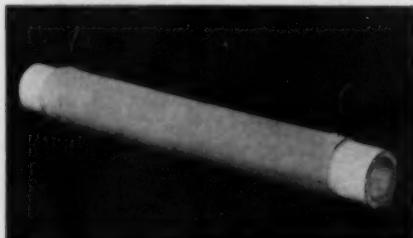
Consult Us on Your Welding Problems.

EXPERT WELDING MACHINE CO.

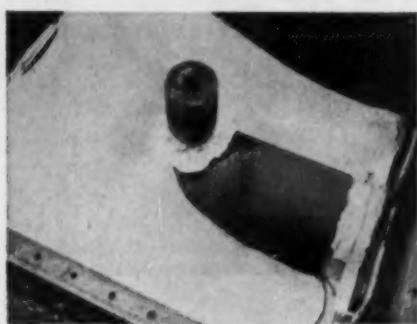
17144 MT. ELLIOTT AVE.
DETROIT 12, MICHIGAN



This molybdenum ribbon-wound ALFRAX muffle is rugged and long-lasting.



ALFRAX tubes and muffles will not react with atomic hydrogen.



Complete insulation with alumina "bubbles" . . . by the shovelful.

For high-temperature electric furnaces
ALFRAX® REFRactories
resist atomic hydrogen and extreme heat
. . . are easily installed!

CARBORUNDUM® has developed a complete line of refractories for hydrogen or cracked-ammonia atmosphere furnaces heated by molybdenum elements. ALFRAX PK refractories are made of pure granular alumina and resist temperatures up to 3000 F. (They contain no silica or reducible oxides . . . to be affected by atomic hydrogen formed at these extreme temperatures).

ALFRAX materials come in a wide variety of forms to fill furnace-design needs:

...as muffles, tile, brick, or other normally required special shapes.

...as tiny bubbles of pure alumina that can be shovelled into muffle-type furnaces . . . for insulation between the shell and the wound muffle.

...as pure alumina castable cement that is simply mixed with water for use anywhere you want the convenience of a castable.

...as embedding cement to coat heating elements . . . that insulates and withstands extreme heat.

ALFRAX refractories offer other advantages—chemical inertness, excellent electrical resistance at high temperatures, and dimensional accuracy. Write today, for your free copy of our booklet on these refractories for high-temperature electric furnaces. Address Dept. B15, The Carborundum Company, Refractories Division, Perth Amboy, N. J.

CARBORUNDUM
Registered Trade Mark

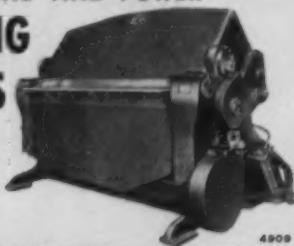
...also offers these advanced special-purpose super refractories:
silicon carbide • fused aluminum oxide • electric furnace mullite • stabilized zirconia • boron nitride • boron carbide • zirconium boride • titanium boride • chromium boride • molybdenum boride • nickel aluminide.



**STEEL HAND AND POWER
BENDING
BRAKES**

For Single and Quantity Runs
Bending Steel Plate and Sheet
Metal

Special Bending Brakes
Double Folder Brakes



4909

DREIS & KRUMP
MANUFACTURING COMPANY

7430 S. Loomis Blvd., Chicago 36, Ill.

CHICAGO
STEEL BENDING BRAKES
FOLDING PLATE BRAKES
FOLDED SHEET BRAKES

ENTERPRISE

GALVANIZING COMPANY

2515 E. Cumberland Street Philadelphia 25, Pa.



**THE KING
PORTABLE
BRINELL**

A hardness tester particularly adapted
for use on CASTINGS and FORGINGS

Puts an actual load of 5000kg on a 10mm ball.

Throat, 4" deep.
Base, 10" high.

Weight, 23 lbs.

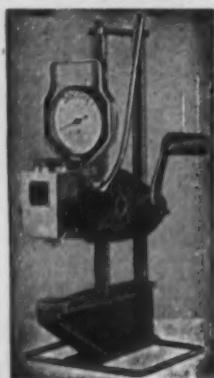
Can be used in any position—even upside down.

Equally accurate as portable or stationary equipment.

Test head removable for testing larger pieces
beyond the capacity of the standard base.

ANDREW KING

Box 606, Ardmore, Pa.



To Your SPECIFICATIONS

**GRiffin
COLD ROLLED STRIP STEEL**

SALES AGENTS:

WM. H. LEONORI & CO., Inc., 30 Howard St., New York 13, N. Y.;
CHARLES L. LEWIS, 2450 17th St., San Francisco 10, Cal.; J. J. LAMBERT 323 Huntington Ave., Buffalo, N. Y.;
CENTRAL STEEL & WIRE COMPANY, 13400 North Mt. Elliott, Detroit 12, Mich.; 3000 West 51st St., Chicago 60, Ill.; Box 148 Annex Station, Cincinnati 14, Ohio; JOHN E. LOVE, 2832 East Grand Blvd., Detroit 11, Michigan.

GRiffin MANUFACTURING CO. • ERIE, PA.



*Quality
costs
no more!*

**YOU PUT POWER IN
WITH YOUR PRODUCT**

**SARGEANT + WILLIAMS
HEAT TREATING CORP.**

- Bright Annealing, Braking, Hardening of Steel-Ingot Steel
- Cycle Annealing of Laminations—Silicon, Iron, Sheets
- Certified Equipment*
- Specifications Rigidly Enforced

Please Write or Wire for Complete Information
Sample Processing Without Obligation

**SARGEANT + WILLIAMS
HEAT TREATING CORP.**

178 YORK AVENUE • PANTUCKET • RHODE ISLAND

*See Head by Mr. G. S. Air Force

*Versatility counts in
HOT DIP GALVANIZING*
any size or shape product, any size
order from the smallest to the largest
Excellent facilities
for pickling and oiling

ENTERPRISE

GALVANIZING COMPANY

2515 E. Cumberland Street Philadelphia 25, Pa.

THE CLEVELAND STEEL TOOL CO.

Punches, Dies, Chisels, Rivet Sets
660 E. 82nd St., Cleveland, O.

If it's RIVETED you KNOW it's safe

LELAND-GIFFORD

LELAND-GIFFORD COMPANY, WORCESTER, MASSACHUSETTS

*BIG NAME
in DRILLING
MACHINES*

New

Pat. App.
for

ARMSTRONG T-SLOT CLAMPS
Make rigid set-ups in minutes on planers, drill
presses, milling machines or other T-slotted beds
or platens. Clamp slides or rotates to position on
anchoring T-slot bolt. Drop forged, heat-treated
body. Heat-treated screw has V-slotted swivel
cup.

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
5209 Armstrong Ave., Chicago 30, U.S.A.

**WIRE — STRIP, COILED
FOR ELECTRIC FUSE
ELEMENTS
EYELETS ALSO BRASS OR STEEL**
Zinc
THE PLATT BROS. & CO., WATERBURY, CONN.

**STEEL TUBING
SERVICE STEEL**

DETROIT • BUFFALO • CHICAGO • CINCINNATI • LOS ANGELES



**THE INTERNATIONAL HARDNESS SCALES
(BRINELL-SHORE)**

are included in Our Improved Portable Scalescope Model D-1. This efficient Single Scale tester registers Brinell-Shore values under otherwise inaccessible conditions. 100% portable for floor and field work, dead soft metals or superhard steel either of brittle or thin gauge sections, non-destructive, accurate, speeds always reads at first glance.

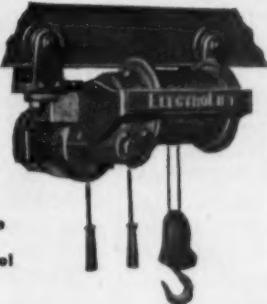
Send for interesting Technical Bulletin and Prices
THE SHORE INSTRUMENT & MFG. CO., INC.
9025 Van Wyck Ave., Jamaica, N. Y.

10 GOOD REASONS

*for Unfailing Performance
... Greater Efficiency*

of ELECTROLIFT WORM DRIVE HOISTS

- Close headroom
- Hoist fully enclosed
- Worm brake holds load
- Automatic electric brake
- Hoist drum fully grooved
- Automatic lubrication
- Alloy steel worm shaft
- Drum guards protect cable
- Optional pushbutton control
- Low operating costs



Call the Electrolift representative listed in your telephone directory.

ELECTROLIFT

ELECTROLIFT, INC., 204 Sergeant Ave., Clifton, N. J.

COWLES

GANG SLIDING KNIVES

OVER 30 YEARS EXPERIENCE

Standard for Service
and Durability.
Ground to extremely
close Tolerances and
Finish. Made by
Toolmakers.

COWLES
TOOL COMPANY

2086 W. 110th ST. CLEVELAND 3, OHIO



*Cutting off
Machines for
Sawing All Kinds
of Metals*

THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

Now... a new principle... a new approach to rapid deburring and chamfering of inside and outside diameters.

NOBUROD and NOBURSINK
High Production Partners!

Companion tools — NOBURSINK for openly accessible hole faces and NOBUROD for outer ends of rods, tubes and bosses — provide greatly improved work quality, faster and easier than ever before. Both have low torque design permitting rapid, off-hand workpiece handling without chatter — even on large diameters. Unique design allows regrinding without special tools.

Eliminate makeshifts and less efficient tools

Both NOBURSINK and NOBUROD tools work equally well on all metals. Cutting chips are freely expelled from the work area. Each tool accommodates a wide range of work size — and are furnished 90° included angle (produces 45° chamfer).

WRITE for FULL DETAILS TODAY!!

NOBUR MANUFACTURING CO.
717 No. Victory Boulevard, Burbank, California

Heavy Weldments



designers
and
builders
of
equipment
for
basic
industries

McNally Pittsburg is well staffed and equipped at their Wellston, Ohio and Pittsburg, Kansas plants to provide heavy weldments to meet your most exacting specifications or we will assist you in problems of design and production.

For designers, manufacturers and users of heavy industrial equipment McNally offers:

• SERVICES •
Engineering Design Field Erection
Research & Development

• MANUFACTURING •

Specifications Cast Iron	Structural Steel
Heavy Machining	Pintework
Assembly	Brazing Relieving

M C NALLY PITTSBURG
MANUFACTURING CORPORATION

• OFFICES •

Pittsburgh, Pa.
First National Bank Bldg.

Chicago, Illinois
207 N. Michigan

• PLANTS •

Pittsburg, Kansas

Wellston, Ohio

RAILWAY EQUIPMENT FOR SALE

Used - As Is - Reconditioned

**30-Cubic Yard,
All-Steel, Automatic,
Drop Door,
SIDE DUMP CARS**

RAILWAY CARS

All Types

"SERVICE-TESTED"

FREIGHT CAR REPAIR PARTS

For All Types of Cars

LOCOMOTIVES

Diesel, Steam, Gasoline,
Diesel-Electric

RAILWAY TANK CARS and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon
Cleaned and Tested

CRANES

Overhead and Locomotive

RAILS

New or Relaying

IRON & STEEL PRODUCTS, Inc.

General Office

13496 S. Brainerd Ave.
Chicago 33, Illinois
Phone: Mitchell 6-1212

New York Office

50-b Church Street
New York 7, N. Y.
Phone: BElkman 3-8230

**"ANYTHING containing IRON
or STEEL"**

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

See Slump's End . . . While there is no landslide, machine tool activity in the Chicago area was gaining strength last week, after moving out of a mild late January slump. The slump, though noticeable, wasn't enough to keep the majority of used machine tool men from calling the fourth quarter the best in a thorny year. This improvement supplied encouragement enough for several forecasters to prognosticate a continuing improvement through first quarter.

Normally mid-January sees a mild upturn as turn-of-the-year advertising pays off. However, current advances suggest more than the annual upswing and ordering is on enough of a long range basis to make prospects for the entire quarter look good.

Report Eastern Business . . . For instance, some heavy steel fabricating equipment has been moving eastward for the first time in months, and it is still hard for some used tool sellers to believe that eastern buyers have been in town, dropped their orders, and gone back home. At least one block of these orders is for a capital expansion that will call for deliveries as needed at least through the remainder of first half 1955. As a result, local firms are alerting their East Coast contacts, and the reports that have come back thus far, while not mentioning any large orders, suggest that good things may be coming later in the opening months of this year.

From the West and South, market areas more commonly served by tool suppliers in the Chicago area, inquiries have been trickling in for several months. Last month and again this month, an increasing number of inquiries blossomed into bona fide orders. The defense work, other than in rebuilding, that used to make these markets particularly attractive, hasn't revived strongly. More and

more of the new business comes from purchasing agents who are replacing equipment or beefing-up output on existing production lines. In either case, the customer is seeking to cut costs to the bone, is very conscious of any price differences.

Time Buying Up . . . Despite some disagreement, there seems to be some increase in time selling, particularly to smaller shops. What seems more important, the customer can now be sold. A year ago at this time he was losing interest in any purchases, no matter what terms or price.

Along with the increase in customer purchasing has come a mild freshening of buying by used tool dealers. The mild inventory overload that had been reported from other areas in fourth quarter didn't worry midwestern dealers greatly at the time and their sitting pat on a full floor of tools seems to be borne out this month by the advance in their own sales. The net effect has been to boost their own purchases as they replace the tools they are selling, and the healthy outlook for the next two months has encouraged some inventory expansion.

Jobbers Report Pickup . . . Buying by small jobbers hasn't hit all dealers with the strength they had been hoping for. But there is enough improvement reported among scattered suppliers of used tools to these small jobbers to indicate that they are more encouraged about their own outlook, can be sold more easily than was the case all year. In at least two cases, sales were landed by a concerted drive to get small shop business. It has paid off this month though even the sellers agree they wouldn't have had much chance with these particular customers in 1954.

THE CLEARING HOUSE

EASTERN Rebuilt Machine Tools

THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

VERTICAL BORING MILLS

- 34" Bullard, m.d.
- 42" Bullard Spiral Drive, m.d.
- 42" Bullard New Era, m.d.
- 42" King, with side head and plain swivel head on rail
- 44" Putnam, m.d., p.r.t.
- 44" Niles, m.d., p.r.t.
- 48" Niles-Bement-Pond Car Wheel Borer, m.d.
- 53" Niles Heavy Pattern, m.d., p.r.t.
- 100" Niles Heavy, m.d., p.r.t.
- 102" Niles Wheel Turning Boring Mill
- 12" Niles, m.d., p.r.t.

BROACHING MACHINES

- 75 H.P. LaPointe Hydraulic Broach, m.d.
- 12x72" Thompson Automatic Flat Broach, m.d.
- 10 ton, 84" stroke Single Ram Vertical Surface LaPointe, m.d., late
- Type SBD-42-6 American Vertical Hy. Dup. Broach
- Type SBD-48-15 American Vertical Dual Ram Surface Hydr. Broach
- Oligear Hydraulic Broach, type XA, 54" stroke, m.d.

We carry an average stock of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY

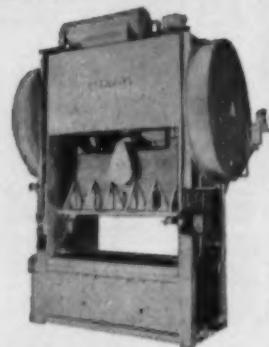
1002 Tennessee Avenue, Cincinnati 29, Ohio

Melrose 1241

CABLE ADDRESS-EMCO

WORLD'S LARGEST STOCK STAMPING PRESSES

BLISS • CLEARING • CLEVELAND
FERRACUTE • HAMILTON • L & J
NIAGARA • TOLEDO • V & O



SQUARING SHEARS • PRESS BRAKES
REBUILT and GUARANTEED

JOSEPH HYMAN & SONS

TIOGA, LIVINGSTON & ALMOND STS

PHILADELPHIA 14 PA Phone REGENT 9-7727

Need Air?

CALL

AMERICAN AIR of JERSEY

AIR FOR SALE OR RENT

SINCE 1902

GAS • DIESEL • STEAM • ELECTRIC

New and Quality Rebuilt

STATIONARY

- 484 CFM 3500 psi 3 stage Ingersoll Rand 25HP Elco 122" dia. 100% oil 70" Worthington MHD 150" dia. 125" CFM 100 psi 6% x 4% Davey V80 6 available
- 142 CFM 125 psi 6% x 5% Worth M-25 25 HP Elco
- 234 CFM 125 psi 10x10 Ingersoll ER-1 40 HP Elco
- 268 CFM 600 psi 4% x 10% Ingersoll 75 HP Synch.
- 270 CFM 125 psi 10% WL-00 2 available
- 278 CFM 125 psi 2" stage Chicago PB 30 HP Elco
- 280 CFM 125 psi 3" stage Gardner 30 HP Elco
- 280 CFM 100 psi 5 cylinder Davis 50 HP Elco
- 281 CFM 40 psi 3 cylinder Ingersoll Type 48
- 285 CFM 125 psi 10x11 Chicago T-B 2 available
- 312 CFM 100 psi 4 cyl. Gardner "AAG" 40 HP
- 343 CFM 500 psi 11x11 Worth 100 HP Elco or steam
- 384 CFM 20 psi 12 x 7 Gardner "RX" 2 available
- 582 CFM 125 psi 10x10 Ingersoll 100 HP Elco
- 644 CFM 100 psi 10x10 Chicago PB 100 HP Elco
- 679 CFM 100 psi 15% x 12 Ingr-XB
- 931 CFM 95 psi 17x13 Chicago T-B Steam or Else
- 1085 CFM 35 psi 20x12 Penn 3-A 100 HP Elco
- 1574 CFM 100 psi 22x14x16 IR-PRE 3 available
- 1576 CFM 60 psi 16x18x14 Penn DB-1 100 HP Elco
- 1725 CFM 110 psi "XPV" 4 corner Ingersoll Steam

VACUUM PUMPS (Dry)

- 354 CFM 14x5 Ingersoll Rand
- 720 CFM 18x7 Worthington
- 860 CFM 18x9 Worthington
- 5001 CFM 30-50x12 Ingersoll Rand XVH 300 HP 3-60-2300 (2) available

PORABLES—15 CFM to 600 CFM

AMERICAN AIR COMPRESSOR CORP.

DELL & 48TH STREET

NORTH BERGEN, N. J.

Telephone UNION 5-4848

B & S No. 2 Automatics, H.S.
B & S No. 3A Universal Mill.
Hardinge Model H.C.T. Chuckers.
Besly No. 372-82 Wet Grinder.

D. E. DONY MACHINERY CO.
4387 St. Paul Blvd. Rochester 17, N. Y.

IMMEDIATE DELIVERY

★LITTELL FEEDING & STRAIGHTENING MACHINE
Model 7-76, will handle .062" x 74" wide stock, self contained with its own hydraulic drive & feeding unit, can be set to feed stock between 30" to 100" long, new in 1950.

★CLEVELAND FEEDING & STRAIGHTENER

Specs same as above except machine will handle 40" wide material & is new in 1940.

★AUTOMATIC COIL CRADLE

Conveyer type, will handle coils 44" wide 56" O.D. 20,000 lb. Cap., Louis Allis 10 HP adjusta speed AC motor, can feed from 300" to 1200" per min., provided with air cylinder to absorb shock so that coils may be rolled into cradle. New in 1951.

★YODER SLITTING LINE

Consisting of power driven uncoiler, slitter, scrap chopper, coil recoller with automatic expanding hydraulic mandrel 20" expanded, hydraulic push off, hydraulic coil car, will handle 12,000 lb. coils 125" x 24" wide, New in 1941.

★UNITED ROLLER LEVELER

84" wide 5 1/2" dia. 17 rolls, backed up, modern roller bearing machine.

★LANDIS PIPE THREADER & CUTTER

8" to 18" cap. with chasers.

★YODER SLITTER

Heavy duty 54" wide, 4 cuts 3/8" stock, extra knives, arbors, fingers, etc.

★YODER ROLL FORMER & CUTOFF

5 stand M2 1/2, AC 3 cutoff.

★BROACHES

Cincinnati 10 ton 66" stroke, dual ram. Chain Footlrb type 60" tunnel.

AMCO MACHINERY COMPANY

125 LEIB ST. DETROIT 7, MICH.

LORAIN 7-1070

PRACTICALLY NEW



2 — No. 4CH KEARNEY & TRECKER
Vertical Milling Machines, 15 HP main drive motor, 3 HP feed & rapid traverse motor, 1/4 HP coolant motor; 24 speeds 15 to 1500; table 74" x 15 1/2"; monolever control; back lash eliminator; coolant system; micrometer stop and dial indicator.

O'CONNELL
MACHINERY CO.
Tel: BAiley 5800
1693 GENESEE ST. BUFFALO 11, N.Y.

REDUCTION GEARS

- 380 KW General Electric High Speed 3.6:1
- 150 HP Fawcett double reduction 11.7:1
- 125 HP Farrel-Birmingham 4.7:1
- 40 HP Varipitch, 860 to 1395/660
- 3 HP James Planetary 85.75:1
- 2 HP variable speed 1140 to 23.8/2.38
- F. H. CRAWFORD & CO., INC.
30 Church St., New York 7, N. Y.

BENNETT MACHINERY CO.

20"—32" x 168" can. Amer. Pacemaker, 49 64" x 68" can. Niles Lathe
36" Rockford Hydraulic Slotted
24", 42" & 64" Bullard Mills
(Send for list of 200 stock tools)

375 Allwood Rd. Clifton, New Jersey

Phone: FERGUSON 9-8894 N. Y. 9-10000 3-1000

KNOX

REBUILT

AIR COMPRESSORS

FULLY GUARANTEED

EARL E. KNOX COMPANY

111 BAGGON STREET

ERIE, PA.

THE CLEARING HOUSE

CALL Curry!

FOR SURPLUS STEEL PLANT EQUIPMENT

1—24" Wide Continuous Hot Strip and Plate Mill, 13 Stands for rolling slabs 3" x 24" x 10'. Including Furnaces, Electrics and Spares.

1—Striene Pack Shear Line, Complete with 4 Shears, Conveyor, Electrics, etc. Capacity 160' long x 62" wide x 1/4" thick.

1—2000 H.P. Mesta Gear Reducer, Ratio 7.375 to 1.

1—2000 H.P. Mesta Gear Reducer, Ratio 10 to 1.

Write for the Curry List of available steel plant equipment

- 1—3-Hi Sheet Breakdown Mill with Tables.
1—2000 H.P. General Electric Slip Ring Motor, 3/60/2300 volts, 237 RPM. Complete with all Controls.

1—10-Ton Top Charge Electric Arc Melting Furnace, Complete with 2000 KVA, 13,200 v. Transformer, etc.

Curry & CO. INC.
STEEL PLANT EQUIPMENT
941 OLIVER BUILDING PITTSBURGH 22, PENNA.
Phone Atlantic 1-1370

1—3500 H.P. General Electric Slip Ring Motor, Type MT, 3 phase, 60 cycle, 6600 volts, 240 RPM, and Controls.

2—1500 H.P. General Electric Slip Ring Motors, Type MT, 3 phase, 60 cycle, 6600 volts, 443 RPM.

1—1500 H.P. General Electric Motor, Type MCF, 250 volt DC, 40/63/190 RPM, Complete with Blower and Controls.

1—12' x 1/4" Stamco Power Squaring Shear, Rebuilt and Guaranteed.

1—62" x 3/8" Pexto Power Squaring Shear, Complete with 15 H.P. 220 volt Motor, Reconditioned and Guaranteed.

Cable Address: CURMILL-PITTSBURGH

FORGING & HEAT TREATING EQUIPMENT FOR SALE USED—AS IS

I—Model F—1500# Chambersburg Board Drop Hammer, Belt driven. New in 1919. Serial No. 3912-SI. Complete with all parts. In operating condition and may be inspected under power.

I—Model F—1200# Chambersburg Board Drop Hammer, Belt driven. New in 1916. Serial No. 2978-SI. In good operating condition. Can be inspected under power.

I—Model F—1200# Chambersburg Board Drop Hammer, Belt driven. Serial No. 154. In good operating condition. Can be inspected under power.

I—Model F—1200# Chambersburg Board Drop Hammer, Belt driven. Serial No. 2423-SI. New in 1915. In good operating condition. Can be inspected under power.

I—Model F—1000# Chambersburg Board Drop Hammer, Belt driven. New in 1916. Serial No. 3023-SI. In good operating condition. Can be inspected under power.

I—Complete Chambersburg Roller Bearing Type Head Section for 2500# Model F Board Hammer. Serial No. 3319-S2. New in 1942. In good operating condition.

I—2 1/2" Acme belt driven Upsetting Machine. Serial No. M-4291. Complete with all parts. In good operating condition. Can be inspected under power.

I—Water Jacketed Quenching Tank. Inside dimensions 48" wide x 79" long x 3' deep. Excellent condition.

I—Model 15KVA Lapel Converter Spark Gap Type. Serial No. 4893. With automatic turntable and fixtures. Never used.

I—Gas Fired "SURFACE COMBUSTION COMPANY" Hearth Furnace. Hearth depth 6'6" x 36" wide x 22" high. Bottom fired. Excellent condition.

I—Oil Fired Harty Double Hearth Furnace. 45" deep x 28" wide x 14" high. Bottom fired. Good condition.

I—Stewart Oil Fired Hearth Furnace, M'd. by CHICAGO FLEXIBLE SHAFT CO. Hearth depth 6' x 34" wide x 24" high. Bottom fired. Excellent condition.

I—48-W Bruning Printer and Developer. Machine in good working condition. Ideal for small engineering office or architect. Prints to 42" wide by any length.

ADDRESS BOX C-844

Care The Iron Age, 100 E. 42nd St., New York 17

BORING MILL, VERTICAL

100" NILES-BEMENT-POND

2 Rail Heads — P.R.T.

16 Speed A.C. Drive

IN STOCK — IMMEDIATE DELIVERY

LANG MACHINERY COMPANY

28th St. & A.V.R.R. Pittsburgh 22, Pa.

SELECT MACHINE TOOLS

BORING MACHINES

36" No. 32 Lanes horiz. table type.
36" A. 42" Bullard vertical turret lathe.

72" Niles Bement Pend vertical mill.

No. 2 P. & W. Jig Borer, Model 1370

DRILLING MACHINES

4" arm 15" col. Cartine radial, P.F. P.E.
8" arm 18" col. American radial, H.D.

GRINDING MACHINES

8" x 15" No. 5 Brooks & Sharpe Hyd. Surf., 1941
49" No. 1642 Blanchard 2-spd. rotary, new 1946.

72" Hanschek 3-sp. rotary surface, new 1946.

18" x 98" Landis gap type cylindrical, new 1941.

LATHES

No. 5 Jones & Lamson ram type univ. turret (2) lathes.

36" x 38" col. LaBlend H.D., older.

54" x 49" col. Pend. older but exec.

MILLS

1-1/2 & 2-1/2 Cincinnati production.

4-36 & 4-49 Cincinnati hydraulic production.

1-2-3-4-5-6 knee type plain & vertical.

36" x 24" x 12" Ingersoll adj. rail planer type, 1948.

42" x 42" x 18" Ingersoll adj. planer type.

50" x 48" x 18" Ingersoll adj. rail planer type.

PRESSSES

12" x 1/2" Drals & Krump bending brake.

100 ton No. 200 Verson G81 (2) 1946.

100 ton No. 200 Toledo B.S. D.C., conditions.

180 ton 7940 Verson Gap Frame.

150 ton No. 19-I Cleveland G81, late type.

250 ton No. 29 Bilm K-J coining or embossing.

300 ton No. 1899 Hamilton D.C. adj. bed 60" x 100".

400 ton No. 600 Toledo K-J coining or embossing.

500 ton Baldwin Southwark HYSPRESS Hyd., 38".

1000 ton No. 600 Toledo coining or forging.

SHAPERS

24" G & E Industrial universal, ser. 1024AB.

32" G & E Invincible, F.M.D., late type.

UPSETTERS

3/4" Ajax, suspended slides, steel forms.

5/8" Ajax suspended slides, steel frame.

1 1/2" Nat'l. susp. slides, auto-lub. guided ram.

1000 Tools in Stock

Free Illustrated Catalog

MILES MACHINERY CO.

Phone Saginaw 2-3105

2041 E. Genesee Ave. Saginaw, Mich.

IMMEDIATE DELIVERY

BLISS No. 66 Double Action Toggle Draw Press, Bed Area 38" x 33", Stroke of Blankholders 10", Stroke of Plunger 21", Air Clutch, New in 1946.

BLISS No. 88 Straight Side Single Crank Press, Capacity 256 tons, Bed Area 30" x 29", 16" Stroke of Slide, Marquette Air Cushion.

TOLEDO Double Cranks, Nos. 91-42, 92C, 93 1/2C, 93 1/2E.

CLEVELAND Double Cranks, 45-G-72, 45-G-60.

NIAGARA Double Cranks, 67C, 68C, 69BX, 61C.

BLISS Nos. 22K, 23, 25K Knuckle Joint Presses.

"If it's machinery we have it."

NATIONAL MACHINERY EXCHANGE

128 Mott St. New York 13, N.Y.

Canal 4-2470

1—Car type annealing furnace, annealing chamber size 33" lg. x 6" wide x 6" high above bottom of car—complete with gas-fired burners, piping, blowers, car, rack & drives, max. temperature 1550 deg. No heat controls.

1—Upcut Shear, U.E.&F. Co., hydraulic, with pump, motor, tank and accessories; knives 36", opening between knives 7 1/2", stroke 8".

2—10-ton Bossmeyer Convertors, complete with stands, driving mechanism, motors & controls, spare bottoms, spare wind boxes, elec. hydraulic jack cars for changing bottoms and all accessory equipment.

2—Electric scale cars, 100' capacity, 7 1/2 ton, side dump, motor.

Lou F. Kinderman
Box 182 - Niles, Ohio - Phone OL 2-9876

THE CLEARING HOUSE

RE-NU-BILT
GUARANTEED

ELECTRIC POWER EQUIPMENT

Qu.	H.P.	Maker	Type	Volt	RPM
1	2500	G.E.	MCF	600	480/500
2	2000	Whse.	MII	600	220/400
3	1200	G.E.	MCF	600	750/950
4	940	Whse.	QM	250	140/170
5	800	Whse.	QM	250	450/550
6	600	Whse.	QM	250	400/500
7	600	Al. Ch.	CC-316	600	220/300
8	500	Whse.	CC-316	600	220/300
9	450	G.E.	MCF	600	220/300
10	400	Whse.	QM	550	415
11	400	G.E.	MUP	550	300/1050
12	300	G.E.	MPC	250	300/920
13	250	G.E.	MPU	250	400/900
14	200	G.E.	MPC	250	720
15	170	G.E.	MPC	250	720
16	240	Whse.	CB-511B	550	400/800
17	150	G.E.	MPC	600	220/750
18	150	G.E.	MPC	250	1150
19	150	Cr. Wh.	BB-TEPC	250	800
20	150	Whse.	BB-151B	250	900/1800
21	150	Whse.	BB-151	250	300/950
22	100	G.E.	MCP	250	220/1000
23	100	Whse.	BB-151	450	1000
24	100	G.E.	CDP-115	250	1750

M-G Sets—3 Ph. 60 Cy.

Qu.	K.W.	Maker	D.C.	A.C.
			H.P.	Volt
1	2500/2000	G.E.	250	220/400
2	1750/1500	G.E.	510	220/400
3	2000	G.E.	500	220/400
4	2000	G.E.	514	600
5	2000	G.E.	514	600
6	1500	G.E.	514	600
7	1500	C.W.	514	600
8	1500	C.W.	514	30/115
9	1500	G.E.	514	600
10	1500	G.E.	750	600
11	750	G.E.	750	275
12	750	C.W.	514	30/115
13	800	G.E.	750	250

TRANSFORMERS

Qu.	KVA	Maker	Type	Pb.	Voltages
1	5000	Whse.	OIBC	3	3300x2/2400
2	3500	Whse.	OIBC	3	36400/13200x160
3	2000	G.E.	HDVDD	1	66000x1/3800
4	1000	G.E.	HDVDD	1	3400x160
5	1000	Wagner	OIBC	1	13200x160
6	600	G.E.	HD	1	13800x2200

BELYEA COMPANY, INC.

47 Howell Street, Jersey City 6, N. J.

#51A Fellows Gear Shaper—Serial #21252
Lathe type 12" x 48" Landis Type C Universal Hydraulic Cylindrical Grinder Serial #17000.
72" Niles Bement Pond Vertical Boring and Turning Mill—Reconditioned.
#1212A Excello Four Spindle Double End Boring Mill, Late.
#7243 Hold Bismatic Internal Grinder — Serial #12270—Reconditioned and guaranteed.
JA Jones & Lamon Turret Lathe Serial #60459.
(2) Greenfield 22" Hydraulic Internal Grinder — Serials #1-11-11022 and F4-11235.
#47 Hold Single End Boring Mill—Serial #4840.
DB212-A Excello Single End Boring Mill — Serial #10160.
42" Bullard Vertical Turret Lathe, Serial #14001.
2-3-4 Spindle Leland Gifford Drills.
1-1/2" Cylomatic & Tooling.
#20 Brown & Sharpe Standard Plain Horizontal Milling Machine—Serial #4167.
24" Bullard Vertical Boring Mill — Spiral Drive. Serial #15000.
8 x 8" x 1 1/2" Kling Angle Shear Serial #1277.

HAZARD BROWNELL MACHINE TOOLS, INC.
350 Waterman St. Providence 6, R. I.

FOR SALE

2 NEW SINGLE STAND ROLLING MILLS, BY LAMERTONS, LANARKSHIRE. Drive motors dual speed and H.P. Complete with starting gear and auxiliary control motors. Splash lubrication. Clutch on intermediate shaft. Ortmann coupling to rolls. Weight of each 117 tons. Floor space reqd. 46 1/2 in. x 21 1/4 in. Present fitted with rolls 43 1/4 in. dia., x 59 in. long, on barrel. Full particulars from

F. J. EDWARDS LIMITED
359-361 Euston Road, London, N.W. 1, England
Cables Bescotools, London

MOTORS & GENERATORS, etc.

1 YEAR GUARANTEE

Partial Listing Only!

KW	MAKE	TYPE	SPEED
3000	G.E.	New 3-unit	
1150	G.E.	New 3-unit	
350	Cr. Wh.	CCD	1200
9-125	G.E.	MPC	1200

600 V. DC M-G SETS

KW	MAKE	TYPE	SPEED
1200	G.E.	MCP New	720
435	G.E.	MPC	1200
8-100	G.E.	MPC	720
250	G.E.	CD	1200

230 V. DC MOTORS

HP	MAKE	TYPE	SPEED
3-200	G.E.	MPC-125	875/750
8-200	G.E.	MPC	1100
200	G.E.	MDP-450	1300/1000
200	Rel.	1850-T	400/300
150	G.E.		825/750
150	West.	8K	1100
150	West.	8K-175	850
150	West.	1800-T	850
1-100	West.	8K-175	850
1-100	West.	1800-T	1000
1-100	Rel.	1850-T	1000/900

LOW VOLTAGE DC GENERATORS

AMPS	MAKE	VOLTAGE
4000/3000	El Proda.	15/30
3000	G.E.	40
2000	G.E.	50
2000/1500	Chandler	15/24
2000/1000	H.V.W.	615

PHONE—WIRE or WRITE

Your Requirements.

L. J. LAND, INC.

Established 1910

150 GRAND STREET, NEW YORK 13, N. Y.
CAnal 6-976

FOR SALE

1-12" x 16" Waterbury Farrel Foundry & Machine Co. 2-high cold mill used for temper rolling consisting of:

- 1-Roll Stand equipped with composition water cooled bearings.
- 1-2 High Pinion Stand
- 1—Double reduction gear drive, ratio 9.87 to 1
- 1-187 HP General Electric 230 Volt D.C. motor, 300/1800 RPM, 450 Amps, with dynamic braking. Cutler Hammer control panel, Rheostat speed control
- 1-Littell payoff reel with electric brake, 16" expanding drum
- 1-Coilizing reel with 17" drum, driven by 30-40 HP, 400/1600 RPM D.C. Motor
- 2-Coil Handling Trucks with hydraulic lifts for loading and unloading reels.

Numerous spare parts. This mill is offered at \$18,000.00 f.o.b. Sinking Spring, Penna. A real bargain!

Hofmann Industries, Inc.

Sinking Spring, Penna.

BRASS BILLET HEATER

Surface Combustion Hi-speed single row pusher type complete with twin row holding furnace, 9,000# per hr., 8"x15" long brass billets, maximum temperature 2400° F.

ADDRESS BOX C-857

Care The Iron Age, 160 E. 42nd St., New York 17

LIFTING MAGNETS

A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.

Magnet specialists since 1910

Goodman Electric Machinery Co.
1040 Broad St.
Newark 2, N. J.

Locomotive Cranes, Diesel, Gas, Steam, Electric Power Locomotives. Standard and Narrow Gauge Gantry, Rubber mounted and crawler cranes Derricks & Hoists

125 TON LOCOMOTIVE DIESEL ELEC. 1000 H.P.

STONE, THE CRANE MAN

1133 Prudential Bldg., Buffalo 2, N. Y. Mohawk 4494

22" x 336" centers MONARCH model M Heavy Duty Lathe—two carriages, M.D. No. 5 CINCINNATI High Power Plain Miller with motorized overarm No. IL GISHOLT Universal Turret Lathe—new 1946

WIGGLESWORTH INDUSTRIAL CORP.
62 Border St., East Boston 28, Mass.

WORLD'S LARGEST INVENTORY



ELECTRIC EQUIPMENT CO.

P. O. BOX 51, ROCHESTER 1, N. Y.

Want to clean house?

Use The Clearing House

These are the rates that apply for space in the

Clearing House Section

Equipment and Materials Wanted Section

Contract Manufacturing Section

Business Opportunities Section

	1 Time	3 Times	6 Times	12 Times	24 Times	52 Times
1 inch	\$ 12.25	\$ 11.55	\$ 10.95	\$ 10.30	\$ 9.60	\$ 9.00
2 inches	23.75	21.90	20.40	19.20	18.00	17.30
3 inches	34.55	32.85	30.60	27.60	27.00	26.00
4 inches	46.10	43.80	38.40	36.00	34.55	32.65
5 inches	57.60	51.80	45.00	43.00	41.30	39.00
6 inches	65.50	61.20	54.00	51.85	51.05	48.95
8 inches	87.35	76.80	72.00	69.15	65.30	60.95
10 inches	110.00	90.00	80.00	81.35	82.00	76.00
12 inches	133.00	135.00	129.50	122.50	114.00	108.00
15 inches (Full Page)	276.00	259.00	245.00	228.00	216.00	204.00

THE CLEARING HOUSE

USED-GUARANTEED

LOCOMOTIVES

80 Ton Whitcomb Diesel Elec. Std. Ga.
65 Ton Porter Diesel Elec. Std. Ga.
50 Ton Whitcomb Diesel Elec. Std. Ga.
35 Ton Davenport Diesel Mech. Std. Ga.
25 Ton General Electric Diesel Elec. 36" Ga.
20 Ton Whitcomb Diesel Mech. Std. Ga.
12 Ton Whitcomb Diesel Mech. Std. Ga.
10 Ton Davenport Gas Std. Ga.
8 Ton Plymouth Gas Std. Ga. & 36" Ga.

Car Repair Parts
for All Types of
Railroad Equipment

HYMAN-MICHAELS COMPANY

122 SO. MICHIGAN AVE., CHICAGO 3, ILL.

Tel: WAbash 2-4911

TANK
CAR
TANKS

OVERHEAD CRANES

5-ton NEW P&H 48'6" span, 3-motor, 230 VDC cab.
2-7½-ton Shaw, 67'1" and 46'8" span, 3-motor 230 VDC cab.
2-10-ton Shaw, 67'1" span, 3-motor, 230 VDC cab.
1-20-ton Morgan, 4-motor, 5-ton, aux., 48'7" span, 230 VDC.
1-35-ton Northern, 5-ton aux. 75'0" span, 230/360 cu. cab.
1-75-ton Morgan Laddie Crane, 25 ton aux. 4 girder 49'4" span, 230 VDC cab.
100 other cranes—various tonnages, spans and current.

SEND ME YOUR CRANE INQUIRIES

JAMES P. ARMEL—Crane Specialist
718 House Bldg., Pittsburgh 22, Pa.
Telephone: Gr. 1-4449

FOR SALE OR RENT

2-35 Ton G E Diesel Elec. Loco., 36" Ga.
1-25 Ton G E Diesel Elec. Loco., Std. Ga., 1952
1-30 Ton Plymouth ML-5 Std. Ga. Gas. Loco.
1-65 Ton Porter Diesel Elec. Loco.
1-30 Ton Orion Diesel Loco. Crane
1-30 Ton Browning Diesel Loco. Crane
2-3500 CFM Ing.-Rand Syn. Motor Compressors, 1952, unused
1-Large Lot New Spare Parts for 25 Ton Industrial Brownhoist Loco. Crane

B. M. WEISS COMPANY
Girard Trust Building
Philadelphia 2, Pa.

30 Ton — 65 Foot Span BRIDGE CRANE

Northern Engineering Co. Fish belly fabricated—travel motor—trolley motor—30 ton hoist—15 ton auxiliary hoist motor. All 230 volt DC motors—mfd. by G.E.—cab controlled with G.E. controls. Can be seen in operation. Immediate delivery.

THE BOSTON METALS CO.
313 E. Baltimore Street
Curtis 7-5050 - Baltimore 2, Md.

OFFERING
BRIDGE CRANES
ARNOLD HUGHES COMPANY
765 Penobscot Bldg., Detroit, Mich.
Woodward 1-1894

CARS CONSTRUCTION EQUIPMENT

70 Ton Flat Cars 52'6"
70 Ton Flat Cars 40'6"
50 Ton Flat Cars 52'6"
50 Ton Flat Cars 40'6"
70 Ton Gondolas 40'6"
50 Ton Gondolas 40'6"
50 Ton Twin Hoppers
40 Ton Steel Sheathed Box Cars
20 Yd. Koppel Air Dump
5 Yd. Koppel Air Dump
Jordan Spreader

Locomotive Cranes
Caterpillar Tractors
Crawler & Truck Cranes
Crawler & Truck Shovels
7 to 25 Ton Capacity
Euclid Dump Trucks
International Dump Trucks
Motor Graders
Air Compressors
Wagon Drills

FOR SALE

Freight car repair parts
Relaying rails
Steel storage tanks
Freight cars and
Locomotives

ALSO

2-42" Bullard Spiral
Drive Vertical Turret
Lathes—1944

1-42" Bullard Vertical
Turret Lathe, New Era
Contracting Equipment
Cranes—Tractors
Ditchers—Compressors
Diesel Engines
and Generating Sets

THE PURDY COMPANY

8754 S. Dobson Ave.
Chicago 19, Illinois

St. Louis, Mo. So. San Francisco, Calif.
Los Angeles, Calif.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT

MOTOR GENERATOR SETS

K.W.	Make	RPM	Volts	A.G.
1 (8-E)	Wheat.	720	600	4400/2400
1200	Wheat.	720	600	2200
1200	C.W.	720	375	2200/1400
400	G.E.	1800	135/220	440
400	G.E.	720	275	2200
250	G.E.	720	275	2200/1400
100	Wheat.	720	375	2200
100	C.W.	1200	135	440/320
85	C.W.	1200	360	4400/3200

DIRECT CURRENT MOTORS

230-VDC

HP	Make	Type	RPM	
2	Wheat.	CD-140	600	
2	Wheat.	MD-1	225/1400	
1*	Wheat.	MD-1	225/1400	
1200	Wheat.	MD-1	600	
800	Wheat.	MD-1	600	
700	Wheat.	MD-1	225/700	
250	G.E.	CD-140	1150	
250	G.E.	MD-1	225/975	
250/250	G.E.	MD-1	225/975	
250	Wheat.	MD-1	225/1300	
100	G.E.	MD-1	600	
90/105	G.E.	MD-1	625/1125	
125	Wheat.	SK-180	600	
125	Wheat.	SK-184	875/850	
125	Wheat.	SK-184	875/850	
75	G.E.	SK-184	875/850	
75	G.E.	SK-184	875/850	
75	Wheat.	SK-184	875/850	
60	Wheat.	SK-184	510/1700	
25	G.E.	RP-14	500/1500	
25	Wheat.	RP-14	500/1500	
25%	Wheat.	SK-180	400/1200	
25	Wheat.	SK-184	400/1200	
25	G.E.	CD-140	300/1200	
25	Wheat.	CD-140	300/1200	
18	Wheat.	SK-184	575/550	
18	Reliance	185-7	600/1600	
25	Wheat.	SK-100L	500/1500	
10	Wheat.	SK-91	350/1000	

(These are T.E.F.O. anti-friction bearings)

*855 and 600 volt

HP	Make	Type	Voltage
750	Pitts.		38,000/2300
607	Wegner		38,000/11,000-3500/6000
560	G.E.		38,000/11,000-3500/6000
523	G.E.		18,000-2000
500	G.E.		3400-2400/1400
150	G.E.		2800-1800-1600/1400
100	G.E.		18,000/2300

T. B. MAC CABE COMPANY

4302 Clarissa St., Philadelphia 40, Penna.
Cable Address: "Macsteel" Philadelphia, Pa. Phone: Davenport 4-8300

FOR SALE SURPLUS STEEL

Merchant Quality Bars

25 tons ¾" x 2" Flat, 20 ft.
30 tons 1¼" Square, 20 ft.
20 tons 1" x 4½" Flat, 20 ft.
50 tons ¾"-1"-1¼"-1½"-1½"-2" Rounds, 20 ft.
15 tons 9/16"-7/8"-1"-1½" Galv. Rounds, 20 ft.

PRICED TO SELL

INDUSTRIAL SUPPLY COMPANY
Box 7366 New Orleans, La. Au. 3761

EST. 1904

DAVIDSON PIPE COMPANY INC.

ONE OF THE LARGEST STOCKS IN THE EAST

Seamless and Welded ½" to 24" O.D.
All wall thickness manufactured.
Specialty large sizes.
Cutting — Threading — Flanging —
Fittings — Valves.

Call GEdney 9-6300
80th St. & 2nd Ave., 8th fl., N.Y.

THE CLEARING HOUSE



New RAILS Relaying

TRACKWORK of ALL KINDS

LIGHT RAILS—12# TO 60#—20'0" & 30'0"
HEAVY RAILS—60# TO 100#—30'0" & 33'0"
JOINT BARS, BOLTS, TIE PLATES, SPIKES &
TOOLS, FROGS, SWITCHES, STANDARD &
SPECIAL TRACKWORK.

SEND US YOUR INQUIRIES

KASLE STEEL CORPORATION

BOX 536 ROOSEVELT PARK ANNEX, DETROIT 32, MICH.—PHONE TIFFANY 6-4700

ALSO IN STOCK
STEEL
SHEETS & PLATES
STRUCTURALS
and Aluminum Products

New RAILS Relaying
Railway Track Accessories
STANDARD IRON & STEEL CO.
Office & Yards: Knoxville, Tennessee



GREENPOINT IRON & PIPE CO. INC.
Fogart, Stagg & Meadow Sts.
Brooklyn, N.Y.

RAILS

FOR IMMEDIATE DELIVERY

500 Tons 80# ASCE	Relay
400 Tons 90# ARA-B	Relay
150 Tons 90# ASCE	Relay
TIE PLATES • Excellent Relay	
TURNOUTS—LIGHT RAILS	
TRACK ACCESSORIES	

MORRISON
RAILWAY SUPPLY CORP.
814 Rand Bldg., Buffalo, N.Y.
MOR-1-5820

New RAILS Relaying
We carry frogs, switches, spikes and bolts in stock
and most all sections of rails and track accessories.
M. K. FRANK
480 Lexington Ave., New York, N.Y.
Park Building, Pittsburgh, Pa.
105 Lake St., Reno, Nevada

EQUIPMENT AND MATERIALS WANTED

WANTED

Approx. 5000 sq. ft. Asbest. cov. Siding,
2½" corr.
100 tons 1¼" Rd. bars, H.R. Mild steel,
mill lgths.
100 tons ½" x 6½" Plates, Mild steel,
mill lgths.
100 tons 1" x 8" Plates, Mild steel, mill
lgths.
100,000 ½" x 3" Machine Bolts.
Allison cut-off wheels, 16" or 18", No.
3265.
Carbide-tipped cutting tools.

ROCKWELL ENGINEERING CO.
Blue Island, Ill.

WE BUY AND SELL USED OVERHEAD TRAVELING CRANES STRUCTURAL BUILDINGS

Your Offerings and Inquiries Solicited
BENKART STEEL & SUPPLY CO.
CORAopolis, PA.

WEISS STEEL CO. INC.

600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
36 Years of Steel Service

WANTED SURPLUS STEEL

WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois

WANTED

BRIDGE CRANES

ARNOLD HUGHES COMPANY
745 PENOBSCOT BLDG., DETROIT, MICH.
WOrthington 1-1894

Try the

WANTED SECTION

for

"Hard-to-Find"

Materials or Equipment

BUSINESS OPPORTUNITIES

BEFORE YOU BUY OR RENT

Consult
INDUSTRIAL
RENTING
CORP.
132 54th Street
Brooklyn 32, N.Y.

Rent All The Machine
Tools You Need From
ONE SOURCE
With Terms Designed
to Meet YOUR Needs

INDUSTRIAL RENTING CORP.

FOR SALE OR LEASE—COLUMBUS, OHIO

For Manufacturing, Warehouse or Truck Terminal.
Ideal for Steel Products Warehouse and Steel Fabrication.
Building on 40 acres of land located in Whitehall
area. Brick and steel building, one story, 26,000 square
feet, truck height, concrete floor as well as unloading
dock. Floor area can be expanded to any footage
desired. On New York Central Railroad.

UNIVERSAL REALTY & INVESTMENT CORP.
180 E. Broad St. CApital 4-0007 Columbus, Ohio

Have you any factories or plant
sites to sell? This space would
place you in touch with interested
parties, as over 100,000 men
read

THE IRON AGE

CONTRACT MANUFACTURING

THE DIRECTORY OF PRODUCTION SERVICES

[This section appears in the first and third issues
of each month. See advertisers index in those
issues.]

Carrying the announcements of plants offering specialized experience and facilities for
the production of STAMPINGS, SPINNINGS, WELDMENTS, WIRE FORMS, SPRINGS,
SCREW MACHINE PRODUCTS, FORGINGS, CASTINGS, GEARS, DIES, ASSEMBLIES,
SPECIAL MACHINERY, and services such as MACHINE WORK, HEAT TREATING,
PLATING, GALVANIZING, etc.

EMPLOYMENT EXCHANGE

The meeting place for employers and men qualified for positions in the metalworking industry.

Help Wanted Rates

Employment Service Rates

Representatives Wanted Rates

Accounts Wanted Rates

COUNT SEVEN WORDS FOR KEYED ADDRESS

Set solid—50 words or less.....	\$10.00
Each additional word.....	25c
All capitals—50 words or less.....	\$10.00
Each additional word.....	32c
All capitals, leaded—50 words or less.....	\$19.50
Each additional word.....	39c

Situation Wanted Rates

Payable in Advance

Set solid—25 words or less.....	\$3.50
Each additional word.....	10c
All capitals—25 words or less.....	\$3.75
Each additional word.....	15c
All capitals, leaded—25 words or less.....	\$5.00
Each additional word.....	20c

EMPLOYMENT SERVICE

HIGH GRADE MEN — Salaries \$5,000 to \$25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Controllers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 20 W. Jackson Blvd., Chicago 4.

HELP WANTED

PRODUCTION MANAGER

ALABAMA STEEL FABRICATOR
REQUIRES SERVICES OF MAN
EXPERIENCED IN INDUSTRIAL
ENGINEERING

Excellent Opportunity

CONFIDENCE MAINTAINED

ADDRESS BOX C-856

Care The Iron Age, 100 E. 42nd St., New York 17

MANUFACTURERS AGENT— PROTECTED TERRITORY

Metallic Packing—Jacketed phenolic packing—Piston Rings—Valve Plates—Valve Discs Selling to Steel, Glass, Chemical, Oil Industries—Steam Boat Operators—Gas and Oil Transmission Lines—Compressor, Diesel & Gas Engine mfrs.—Railroads. Substantial profit—No investment in inventory or accounts receivable required. Have been in business since 1908. Enjoy enviable reputation quality service in our field. Recently expanded plant facilities. Now expanding distribution. Great opportunity for good aggressive agent. Write and give qualifications.

AMERICAN METALLIC PACKING CO.

GLENFIELD, PA.

Suburb of Pittsburgh, Pa.

General Manager Wanted

Well-established industrial manufacturer, multiple plant operation, seeks General Manager over all manufacturing and sales. Must have successful record in management. Location Chicago area. Salary plus incentive plan. Detailed reply should include salary requirements, education, experience, personal background, photo and references. Replies held in strictest confidence.

ADDRESS BOX C-848

Care The Iron Age, 100 E. 42nd St., New York 17

HELP WANTED

HELP WANTED

METALLURGIST

For Rod Mill, Wire Mill & Wire Products

Must have minimum of two years experience

Here is an opportunity for an energetic man, preferably with Metallurgical Engineering degree, to start at a good salary with one of the industry's most progressive wire makers. For personal interview tell us about yourself—your experience, age, marital status, salary desired. Write in confidence. Our own men have been informed regarding the placing of this advertisement. All replies will naturally be held strictly confidential. Address your application to:

BOX C-855

Care The Iron Age, 100 East 42nd Street, New York 17

SALES REPRESENTATIVE INDUSTRIAL

Old established large Eastern Engineering Firm specializing in aircraft components and assemblies requires a representative with good contacts to solicit contracts. Excellent opportunity for a good producer. Reply in detail stating full particulars.

ADDRESS BOX C-853

Care The Iron Age, 100 E. 42nd St., New York 17

SITUATIONS WANTED

MAN with 25 years total of M/W, operating, mechanical and material handling experience seeks opening with short line or terminal railroad. He has a proven record in methods, procedures and low costs. Address Box C-840, Care The Iron Age, 100 E. 42nd St., New York 17.

YOUNG GRADUATE ENGINEERS situated in Montreal, Toronto, Ottawa and Windsor would like to represent some American manufacturers in Canada. Please state product and terms. Address Box C-858, care The Iron Age, 100 E. 42nd St., New York 17.

STEEL PLANT SUPERINTENDENT—Thirty years' experience all phases plant operations. Hot and Cold, Industrial Engineering and Labor Relations. Address Box C-850, care The Iron Age, 100 E. 42nd St., New York 17.

COMBUSTION-MECH. ENGR., 25 years customer contact; met. background; furnace equipment; high temp. alloys; Pgh. district; salary plus. Address Box C-845, care The Iron Age, 100 E. 42nd St., New York 17.

STEEL SALES ENGINEER—Sales experience with metallurgical or mechanical engineering background preferred. In reply please give age, training and general qualifications. Opportunity and security available to the right man. Address Box C-847, care The Iron Age, 100 E. 42nd St., New York 17.

WANTED — ROLL DESIGNER OR ROLL DRAFTSMAN. Prefer graduate engineer with roll and guide design experience on bloom, billet and bar mills. Steel plant Pittsburgh district. Address Box C-859, care The Iron Age, 100 E. 42nd St., New York 17.

MELTER electric arc furnace, 17 yrs. experience in melting all types of alloy steel, also capable of taking complete charge of melt shop operations, desires position. Address Box C-852, care The Iron Age, 100 E. 42nd St., New York 17.

ADVERTISERS IN THIS ISSUE

An asterisk (*) beside the name of advertiser indicates that a booklet, or other information, is offered in the advertisement. Write to the manufacturers for your copies today.

A	
*Air Products, Inc.	43
*Allis-Chalmers Mfg. Co.	91
*Alto Company	115
Amco Machinery Company	132
American Air Compressor Corp.	132
American Welding & Mfg. Co., The	54
Armel, James F.	135
*Armstrong Bros. Tool Co.	128

B	
*Bath, Cyril, Company, The	12
Beatty Machine & Mfg. Co.	98
Belyea Co., Inc.	134
Benkart Steel & Supply Co.	136
Bennett Machinery Co.	132
Bethlehem Steel Co.	1
Boston Metals Co., The	135
Brownell, Hazard, Machine Tools, Inc.	134
*Brush Electronics Company	111
Buckeye Tools Corp., Inc.	97
Bullard Co., The	49

C	
*Carborundum Co., Refractories Div.	127
*Cincinnati Gear Company, The	64
*Cincinnati Grinders, Inc.	68, 69
*Cincinnati Milling Machine Co., The	68, 69
*Cincinnati Shaper Co., The	47
Cleveland Steel Tool Co., The	128

D	
Colorado Fuel & Iron Corp., The	
Wickwire Spencer Steel Div.	62
Columbia Tool Steel Co.	105
*Cone-Drive Gears Div., Michigan Tool Co.	126
Consolidated Vacuum Corp.	60
Cowles Tool Co.	129
Crawford, F. H., & Co., Inc.	132
Crucible Steel Co. of America	52
Curry, Albert, & Co., Inc.	133

E	
Davidson Pipe Co., Inc.	135
Donahue Steel Products Co.	133
Dony, D. E., Machinery Co.	134
Dreis & Krump Mfg. Co.	128

F	
Eastern Machine Screw Corp., The	138
Eastern Machinery Co., The	132
Edwards, F. J., Ltd.	134
Electric Equipment Co.	134
ElectroLift, Inc.	129
*Electro Manganese Corp.	96
*Elwell-Parker Electric Co.	95
Enterprise Galvanizing Co.	128
Espen-Lucas Machine Works, The	129
Expert Welding Machine Co.	126

G	
Federal Machine & Welder Co.	100
Ferro Machine and Foundry Co.	131
Foot Mineral Co.	11
Frank, M. K.	136

H	
Gardner Machine Co.	21
*General Box Company	123
Gisholt Machine Co.	
Between Pages 28 & 29	
Goodman Electric Machinery Co.	134
Goodyear Tire & Rubber Co.	10
Goss & DeLeeuw Machine Co.	138
Greenpoint Iron & Pipe Co., Inc.	136
Griffin Manufacturing Co.	128

I	
Hendrick Manufacturing Co.	105
Henry, A. T., & Company, Inc.	131
Hofmann Industries, Inc.	134
Hoskins Manufacturing Co.	
Inside Front Cover	
Hughes, Arnold, Co.	135, 136
*Hydraulic Press Mfg. Co., The	66
Hyman, Joseph, & Sons	132
Hymes-Michaels Co.	135

J	
Illinois Gear & Machine Co.	87
Industrial Renting Corp.	136
Industrial Supply Company	135
*Inland Steel Co.	70
Iron & Steel Products, Inc.	130

K	
Koile Steel Corporation	136
Kinderman, Lou F.	133
King, Andrew, Co., The	128
Knox, Earl E., Co.	132

L	
Leclerc-Christy Co., Div. of H. K. Porter Co., Inc.	90
Land, L. J., Inc.	134
*Land Tool Co.	14, 15
Lang Machinery Co.	133
*Leeds & Northrup Co.	20
Less-Bradner Co., The	44
Leland-Gifford Co.	128
*Lowe Bros. Co., The	26, 27
Luria Bros. & Co., Inc.	113

M	
McNally Pittsburgh Manufacturing Corp.	129
MacCabe, T. B., Co.	135
*Magnethermic Corp.	47
Merchant, Geo. F., Co.	104
Midvale Company	50
Miles Machinery Co.	133
Monsanto Chemical Co., Plastics Div.	125
Morrison Railway Supply Corp.	136

N	
National Machinery Exchange	133
National Steel Corp.	45
Newport Steel Corp.	13
*New York & New Jersey Lubricant Co.	88
*Niagara Blower Co.	89
*Nobur Manufacturing Co.	129

O	
O'Connell Machinery Co.	132
Osborn Mfg. Co., The	

P	
Youngstown Welding & Engineering Co.	17

CLASSIFIED SECTION

Business Opportunities	136
Clearing House	136-138
Contract Manufacturing	Appears in first and third issues of each month. See Jan. 6 & Jan. 20.
Employment Exchange	137
Wanted	136

**THREADED ROD
JACK SCREWS
ALLOY STUDS**

PITTSBURGH PLUG AND
PRODUCTS CO. - P.C.H. 15, PA.

famous for accuracy and straightness of threads, less chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 21-41 BURLING STREET, NEW Haven, Conn.
Pacific Coast Representative: A. O. Barber, 284 N. San Pedro St., Los Angeles, California
Canada: P. J. Barber Machinery Co., Toronto, Canada

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating Type

GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

Look for **Pangborn Rotoblast**



ROTOBLAST BLASTMASTER® BARREL. Mathews Heat Treating Co., Newark, N.J., saved \$8,000 on one contract alone by using the Pangborn Blastmaster Barrel with Rotoblast.

wherever blast cleaning



ROTOBLAST TABLE-ROOM. Utica General Jobbing Foundry, Utica, N.Y., saves \$1,200 a year in labor alone with Pangborn Rotoblast Table-Room.

Throughout the country—in small foundries and large ones, cleaning ferrous and non-ferrous pieces, handling castings, forgings, heat treated parts—Pangborn Rotoblast cuts operating costs for foundrymen. But Rotoblast offers more than versatility. This exclusive Pangborn process utilizes centrifugal force for thorough, efficient blast cleaning . . . throwing a great volume of abrasive over a large area with heavy density. It eliminates air compressor investment, saves labor costs, requires less power to operate. The result is *better* cleaning done quickly and cheaply. See how Pangborn Rotoblast can cut blast cleaning costs and save you money!

is done faster and cheaper

Pangborn BLAST CLEANS CHEAPER



Blastmaster
& Continuous-Flo Barrel



Rotoblast Table
& Table-Room



Pangborn Dust
Control Equipment



For faster, cheaper cleaning, investigate Pangborn Rotoblast now. Write today for Bulletin 214 to: **PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md.**

*U. S. Patent 2184906
(other patents pending)



That TIMKEN® 52100 steel tubing you ordered yesterday?—we're shipping it to you today

WE'RE ready to ship your size of Timken® 52100 steel tubing in less-than-mill quantities within 24 hours. That's because 101 sizes are available in mill stock for your rush hollow parts jobs.

A high-carbon chromium steel, 52100 is ideal for most high quality hollow parts jobs. It will through-harden in moderate sections, can be heat treated to file hardness and tempered back to any point you wish. It is often used in place of more expensive steels.

Excellent for hollow parts jobs such as aircraft parts, ball bearing races, pump parts and plungers, collets, bushings, spindles, grinding machine parts and preci-

sion instrument parts, Timken 52100 can be had in sizes from 1" to 10½" O.D.

America's pioneer producer of 52100 tubing, the Timken Company is the *only* company that makes 52100 steel in tubing, bars and wire. We have a background of experience that can't be equalled. In terms of benefits to you, it's an experience that assures uniform quality from tube to tube and from heat to heat.

Want immediate delivery? Write, wire or phone us now your less-than-mill quantity order. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH



TIMKEN
STEELS

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING